MARCH

Trains

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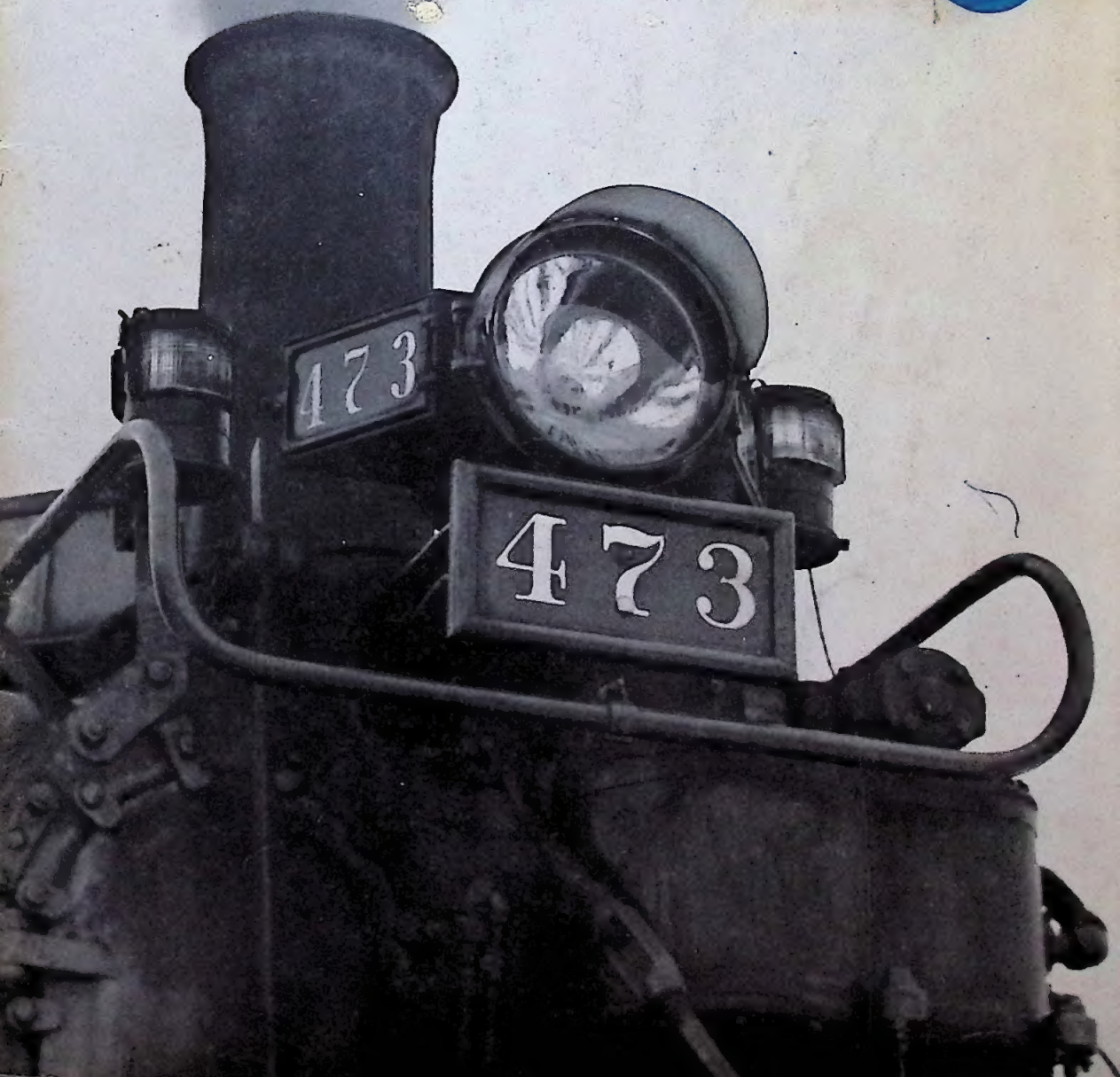

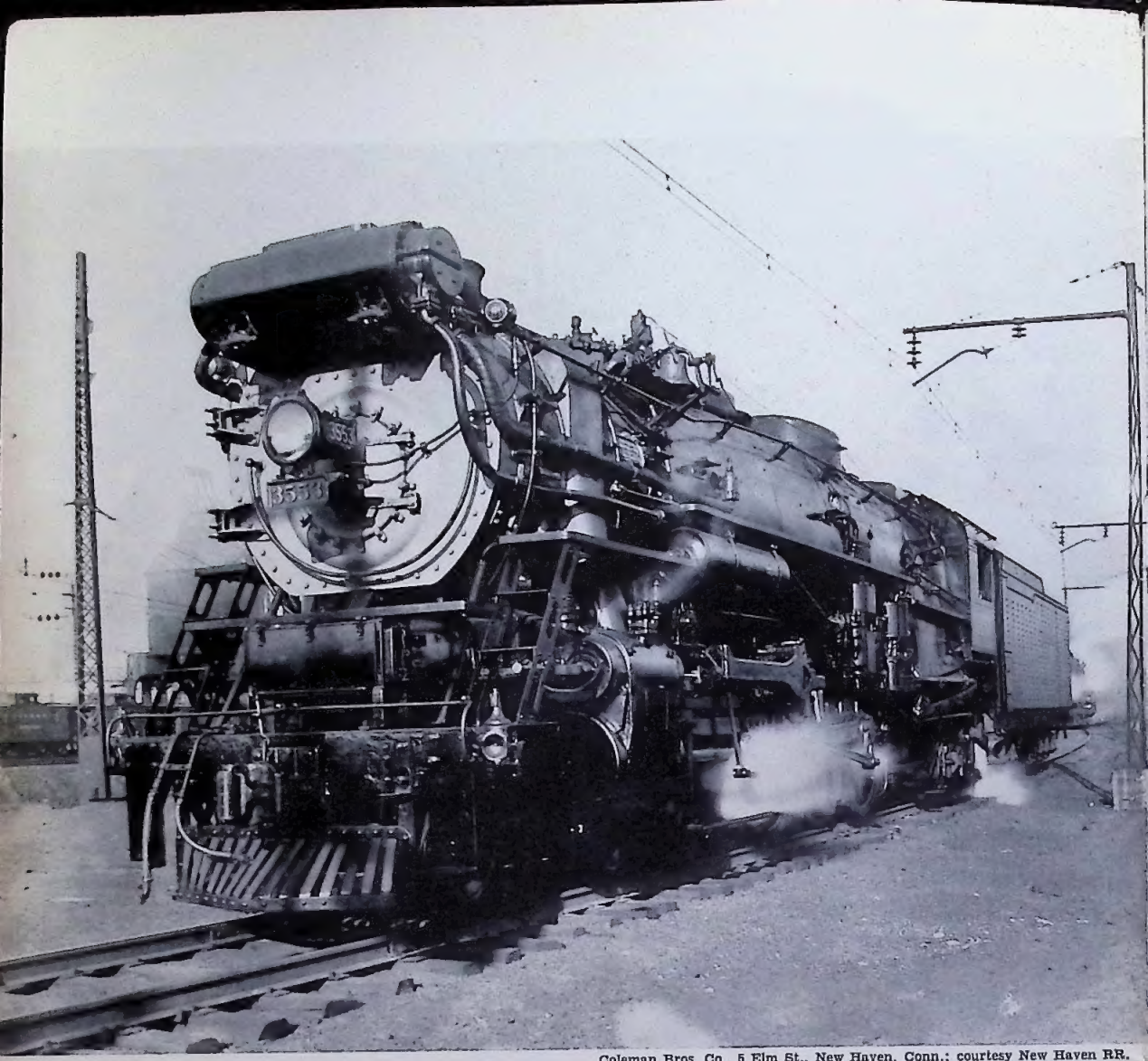

Coleman Bros. Co., 5 Elm St., New Haven, Conn.; courtesy New Haven RR.

This New Haven power pulls 125 cars to Boston.

There are 70 4-8-2 engines on the New York, New Haven & Hartford RR., all having 69″ drivers. This is Class R-3a, which includes Nos. 3553 to 3562, used in fast freight service between Cedar Hill (yard at the end of the electrified division) and Boston, 156 miles, or between Cedar Hill and Worcester, 123 miles. On the Boston run the engines are rated for 5500 tons. The heavier grades and curves on the Worcester line pull the rating down to 3200 tons, which is about the equivalent of an average 70-car train. Each engine weighs about 668,000 pounds with its tender, or about three times as much as the company's smallest Ten-Wheeler. The box on the pilot holds the automatic train stop equipment used on the Shore Line Division. The engine also has thermic syphons, feedwater heater, power reverse, stoker, lubricator, Walschaert vave gear and 22″ x 30″ cylinders which use 265 pounds pressure.

Waybills

Trainmen think railfans are just a bit screwball. And maybe they are. After all, in no other business do people from other walks of life make such a fetish of getting on the property and seeing how things are done. But then no other business has as much appeal to the natural instincts of the average man as do the railroads.

On a local train one day last Summer I sat in front of two deadheading trainmen. It seems there had been a fan trip on their division. "I hear you pulled that special job yesterday," said one. "What was it?"

"A railfan trip."

"What are railfans? Something like railbirds?"

"Worse. Lot's worse. A bunch of plain nuts. Why, they'd like to pull the railroad all to pieces. They want to ride all over the train except in the seats. And they'd even take the coal out of the tender for souvenirs."

Railroad fans often know less about railroad points of interest in their immediate vicinity than do outsiders. The theory seems to be, "I can visit nearby lines any time, so why do it now? I'll visit something far away that I may never have another chance to see." This is sort of Gilbertian philosophy. You remember Ko-Ko in *The Mikado*, who excused an unexecuted execution with, "If your majesty says, 'Let a thing be done,' it is as good as done, so why do it?"

Before commencing publication, TRAINS printed Vol. 1, No. 0, a preview edition for study and publicity purposes. It contained only 8 pages and cover, and much the same material as Vol. 1, No. 1. However, some of you may want it as a collectors' item, and we have a few copies at 25 cents each, postpaid.

A. C. K.

Trains

Editors: A. C. Kalmbach, Linn H. Westcott, Willard V. Anderson

Vol. 1 March, 1941 No. 5

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Cover photo by Lucius Beebe; masthead photo by Francis Denton. Both are of D&RGW narrow gauge outside-frame Mikados.

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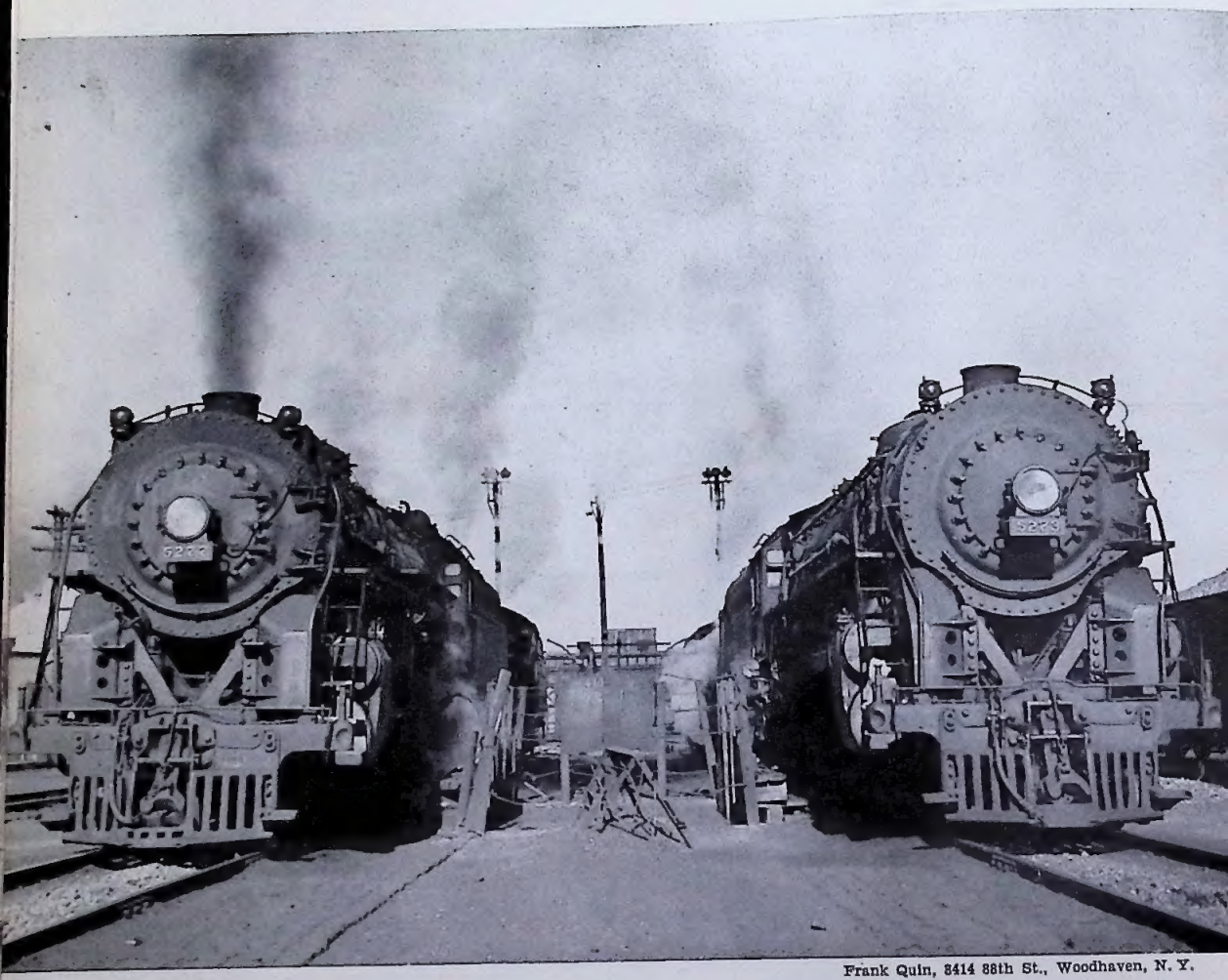

Frank Quin, 8414 88th St., Woodhaven, N. Y.

Coal dust twins clean up at Harmon.

Two locomotives of the famous Hudson type wash up at the New York Central's large engine terminal at Harmon, N. Y. They are 4-6-4's of the J-1c and J-1d classes, No. 5273 on the right and No. 5277 on the left. These engines have been earning their keep on and gaining fame for the NYC ever since the system received them from Alco a dozen years ago. In this photo they have just come from pulling two of the Central's fleet of limiteds; they were replaced at Harmon station by electric engines which, in turn, hauled the trains about 30 miles to Grand Central Station in New York City. These J-1's will probably be assigned to westbound fliers later in the day. Freights also change motive power at Harmon. Built by Alco in 1929, these engines marked the point of building a more efficient machine rather than just increasing size.

SPECIFICATIONS—Class J-1c, Nos. 5265 to 5274 (also Michigan Central Nos. 5355 to 5359); Class J-1d, Nos. 5275 to 5314. These engines are very similar, differing mainly in weight. Cylinders are 25″ x 28″, drivers 79″, pressure 225 pounds, tractive force 42,360 pounds (booster 10,900 pounds).

The Steam Locomotive

★ Is it about to be displaced by other types of motive power, or can it still hold its own?

By M. S. Reigel. *

THE steam locomotive is Action, noisy and spectacular action. All of us have watched it with fascination since childhood. Is the steam locomotive about to be displaced by other types of power, or can it still hold its own?

The spectacular 2227-mile through run of a 4-6-4 steam locomotive from Los Angeles to Chicago on the Santa Fe indicates the capabilities of the modern steam locomotive for long distance runs without change of locomotive. The Milwaukee Road's *Hiawatha* trains running out of Chicago operate at speeds of 100 miles per hour for stretches of 50 or 60 miles, and are pulled exclusively by modern steam locomotives. The steam locomotive has led for years in providing swift movement of people and merchandise, and although the trend of the times is toward faster and faster transportation the steam locomotive has great possibilities for meeting the need.

Of course prophecy is a risky business, but it is interesting to go back to 1812 and note that even before the days of the *Rocket,* Col. John Stevens of Hoboken wrote a pamphlet entitled *Documents Tending to Prove the Superior Advantage of Railway and Steam Carriages Over Canal Navigation,* in which he predicted that some day it might be possible for a steam carriage to move over rails at a speed of 100 miles an hour. Even today, when we know much better the technical limitations and possibilities, we can look ahead to many major changes and can discuss the future of steam locomotives under various factors which limit locomotive performance.

In discussing these various factors I will draw freely upon a paper presented by President W. C. Dickerman of the American Locomotive Company, called *The Possibilities of the Modern Steam Locomotive.* The distance that locomotives can be run is one of the more important limiting factors. Now, of course, that 2227-mile continuous run on the Santa Fe was an exceptional case, arranged as a trial of what could be done. In regular service, one locomotive handles a train from Chicago to La Junta, Colo., a distance of 1003 miles. On arrival at La Junta a larger locomotive is put on the train to handle it over the mountains, and this engine runs through to Los Angeles, 1235 miles. The longest regular run on the Santa Fe is from Wellington, Kansas, to Los Angeles, 1535 miles.

In the case of all these Santa Fe locomotive runs the distance is governed not by the capability of the locomotives, but by grade and operating conditions. For instance, the locomotive that takes a train over the comparatively level country from Chicago to La Junta is not large enough to handle the same train over the mountains on account of grade conditions. But if uniform grade conditions prevailed all the way through, only one locomotive would be required, according to E. G. Sanders of the Santa Fe.

It is difficult on some railroads to obtain long runs because the railroad itself is short, and the answer to this is to make turn-around runs, up the railroad and back again. Even then, consideration must be given to train schedules, profiles, and above all to what the shippers want. What can be done mechanically will not always be possible because of shipments, such as cars of meats, which are offered only at certain times of the day and must then be moved promptly.

In other instances it is difficult to get trains made up to run over two or three divisions, particularly in freight service, so that the distance operated is a result in many instances of the ingenuity of the management or the possibilities of the commercial picture.

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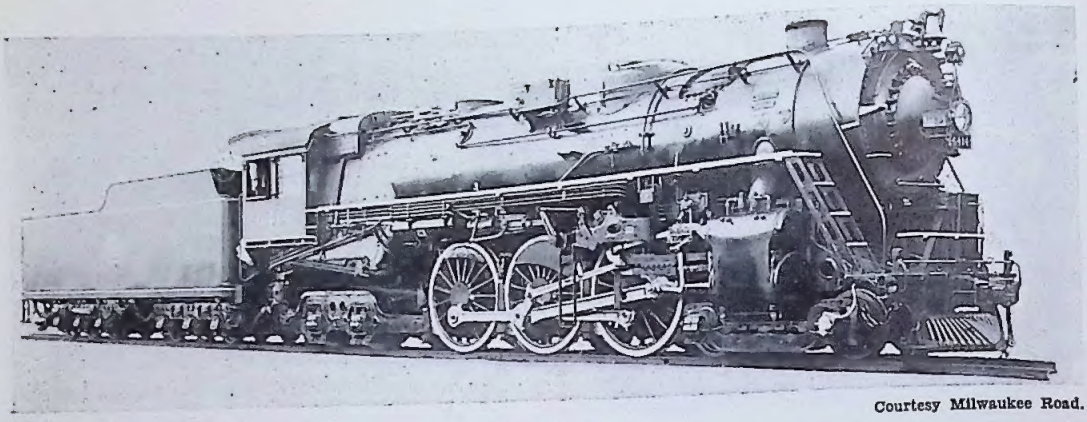
*Assistant engineer of tests, New York Central System. Abstract from a paper presented to the Chicago Chapter of the Railway and Locomotive Historical Society.



Courtesy Milwaukee Road.

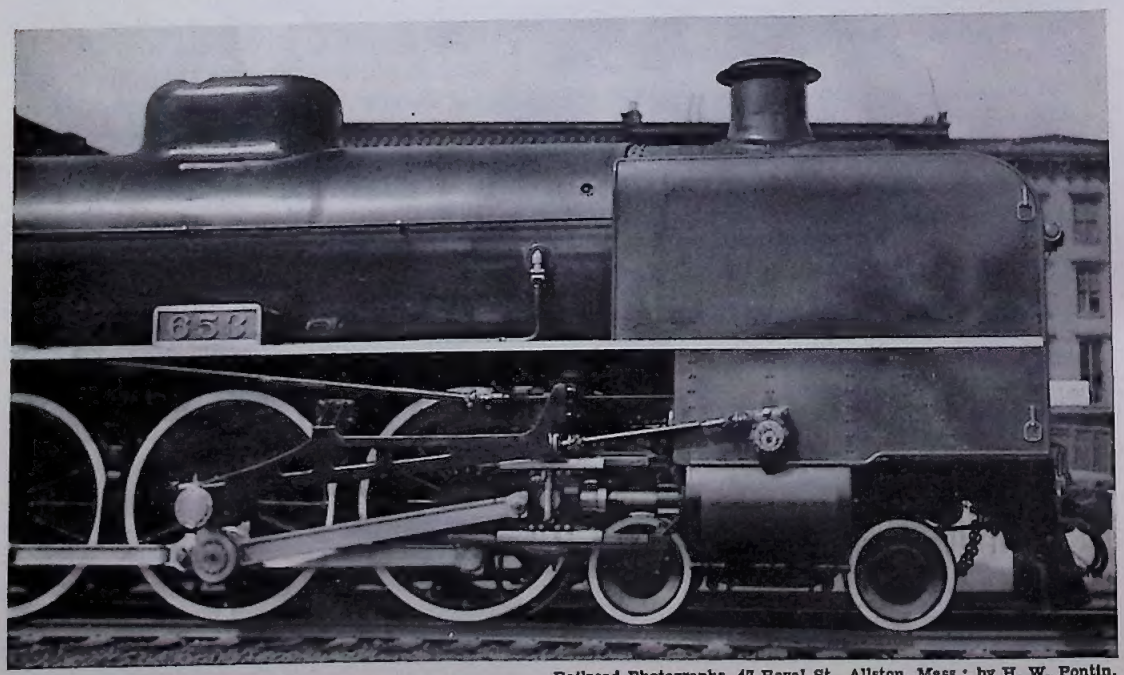
Passenger trains regularly run through, but freight trains are more or less broken up at divisional points due to diverting some cars or adding to the traffic. When conditions necessitate holding a train in the yard, the locomotive can quite often be used to better effect if it is taken from the train and put on some other immediately departing run rather than waiting for switching and makeup of the original train. It is not the steam locomotive which limits the length of run in this case, but the service requirements. The abilities of the railroad management are called upon to fit the power as best it can to the commercial picture.

Milwaukee Road Hudson, Class F-6a.

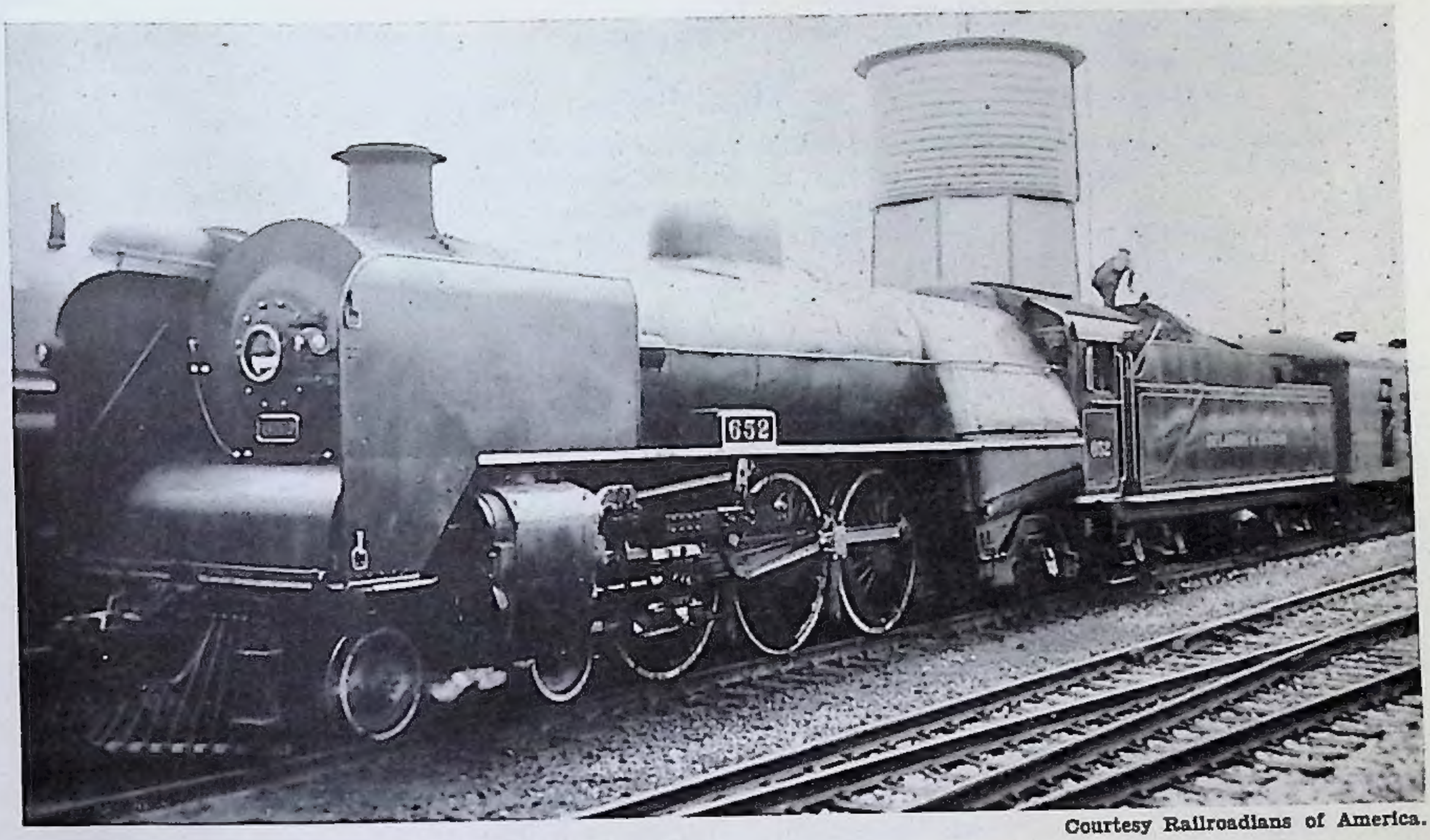
In the Summer of 1934 one of the Class F-6a locomotives made the 85-mile Chicago-Milwaukee run in 67½ minutes. This time has since been bettered —by steam—but then it was an accomplishment. One F-6a ran 18,000 miles in one month. Each of the series has run over a million miles. Drivers, 79″; cylinders, 26″ x 28″; working pressure, 225 pounds; tractive force, 45,822 pounds; weight without tender, 380,220 pounds. Baldwin-built, 1931.

Poppet valve gear.

This closeup shows the poppet valve gear in use on Delaware & Hudson's No. 653, a Pacific of Class P-1. Built in the D&H shops in 1931, this locomotive has 73″ drivers, 22″ x 32″ cylinders, a working pressure of 325 pounds, and a tractive force of 59,500 pounds. The weight without the tender is 296,500 pounds.



Railroad Photographs, 47 Royal St., Allston, Mass.; by H. W. Pontin.



Courtesy Railroadians of America.

Delaware & Hudson Pacific.

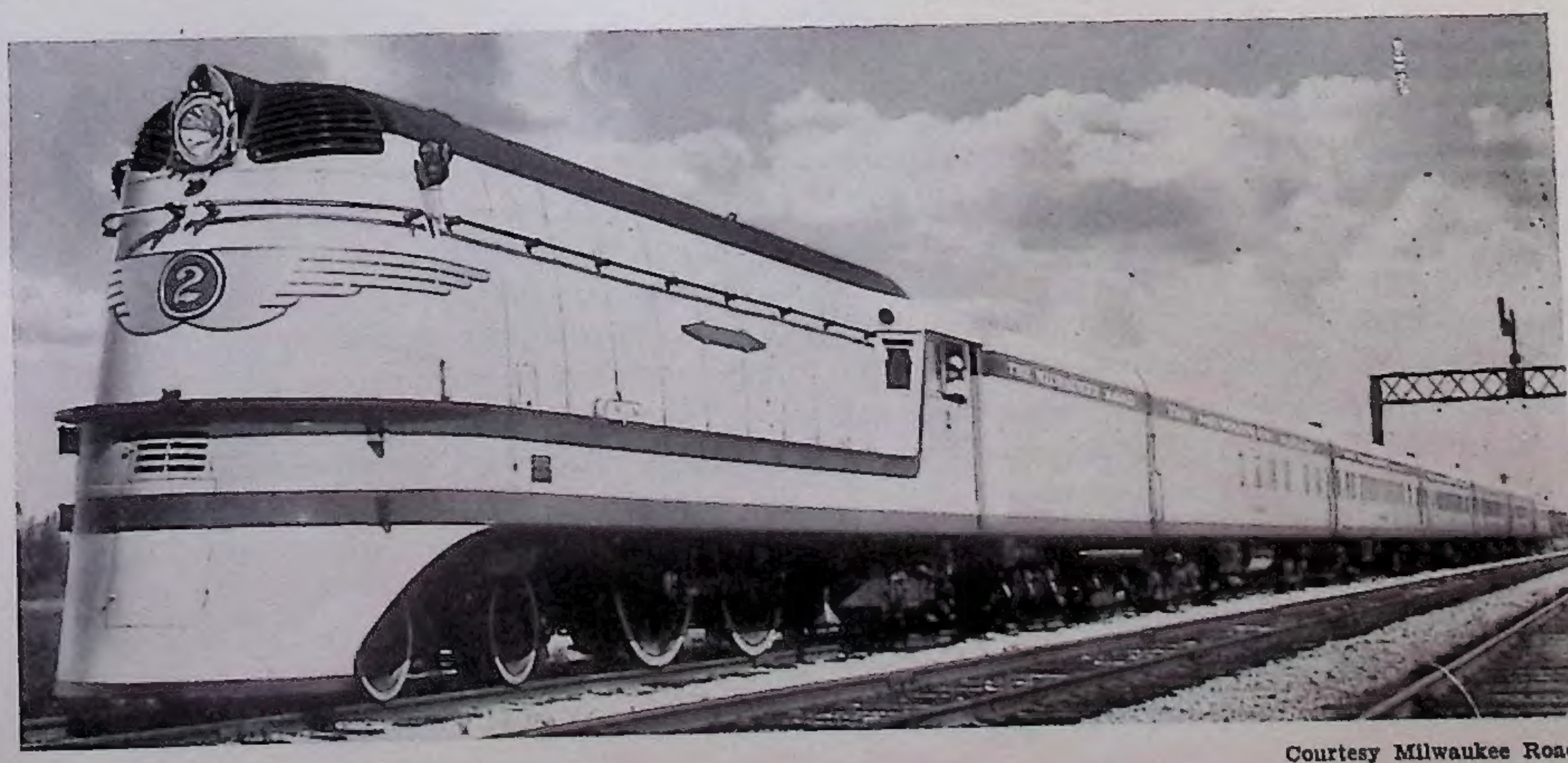
No. 652, although of the same class as No. 653, differs from the latter in many respects: Drivers, 73"; cylinders, 22" x 28"; working pressure, 260 pounds; tractive force, 41,600 pounds; weight without tender, 283,300 pounds. Built by D&H in 1929.

Milwaukee Road *Hiawatha*.

This oil-burning locomotive is a 4-4-2, Class A. It experiences no difficulty in making the Chicago-Milwaukee run in 75 minutes, and has often been clocked at well over 100 miles an hour. Drivers, 84"; cylinders, 19" x 28"; working pressure, 300 pounds; tractive force, 30,685 pounds; weight without tender, 286,000 pounds. Built by Alco, 1935.

SPEED of passenger trains, however, is a mechanical problem. It seems that the high-speed trains are especially appealing to the public. Undoubtedly faster speeds are essential. The 100-mile-an-hour and better performances of the *Hiawatha* trains indicate that the modern steam locomotive can give the needed speed. Further, the steam locomotive has the ability to accelerate rapidly at high speeds, and with restricting curves and interlockings this is very important.

The A. A. R. has conducted tests resulting in the design of a locomotive which will haul



Courtesy Milwaukee Road.

Specific power factors of recent locomotives.

Of the seven locomotives cited in this tabulation, the *City of San Francisco* and *City of Los Angeles* Diesel type is accredited with the maximum rail horsepower (4320), while the rebuilt Paris-Orleans-Midi claims the highest specific power factor, 19.2—about 119 pounds per horse power.

	Rail horse power	Weight in working order (tons)	Specific power factor, horsepower per ton
Steam locomotives.			
Rebuilt Paris-Orleans-Midi (Chapelon), with European-style eight-wheel tender	3500	182.0	19.2
NYC Class J-3 4-6-4, with American-style 12-wheel tender	4230	293.0	14.5
LMS 4-6-2 direct-drive turbine locomotive, gear transmission	2500	171.0	14.7
UP 4-6-6-4 + 4-6-6-4 turbine locomotive, electrical transmission	4000	500.0	8.0
Diesel-electric locomotives.			
PLM 4400 horse power (engine shaft)	3920	246.4	15.9
AT&SF *Super-Chief* 3600 horse power (engine shaft)	2880	283.6	10.2
UP *City of San Francisco* and *City of Los Angeles*, 5400 h.p. (engine shaft)	4320	437.9	9.3

1000 tons at 100 miles per hour on level tangent track. This locomotive was on exhibition at the New York World's Fair, where many of you saw it. Of course 80- and 90-mile-an-hour top speeds with steam locomotives are very common now, even with older power.

Since speed is so essential to the prosperity of the railroad passenger business, a survey of the factors involved in speeds of over 100 miles per hour will be of interest. Modern locomotives having six or eight coupled driving wheels driven from a single pair of cylinders by two main rods can safely operate at speeds in excess of 100 miles per hour. However, the recent trend in high speed locomotive design is to decrease the weight of reciprocating parts by limiting the number of wheels driven by one pair of cylinders. This makes necessary the use of more than one pair of cylinders to obtain high horsepower and results in a design similar to that of the locomotive on display at the World's Fair, which has four cylinders with each pair delivering power to four drivers.

This style of locomotive has been built with two cylinders in the front and two in the back, or in some cases with two in the front and two in the center. The former arrangement is generally preferred because a shorter rigid wheelbase is possible. The work formerly done by two cylinders and sets of rods is divided among four, which permits considerable reduction in weight of rods and other engine parts. A design has been proposed to reduce still further the weight of reciprocating parts by employing four separate steam cylinders for each pair of drivers, but to date such a locomotive has not been built.

Without changing the basic design of the present locomotive, lightweight rods of alloy steel are coming into common use to lighten reciprocating parts. These and many other details of design developed over the years by capable engineers in the railroad field seem to indicate the possibility of higher speeds for the steam locomotive. As President Dickerman of the American Locomotive Company says, "Any new unit or other invention which helps to expedite the movement of men and goods is a useful tool of civilization, and is in itself a triumph."

ENTIRELY apart from speed as an appeal for railroad business is the general efficiency of rail transport, and this is governed largely by the load which a locomotive will haul. The essential advantage of the railroad over other means of transportation is that it is mass transportation, with many cars coupled together into one train, pulled by one motive power unit and handled as one unit. This is what has made it possible gradually to reduce the cost of railroad freight service until today the railroads, as we all know, haul a ton a mile for an average revenue of less than a cent!

Now the load which a locomotive will pull is not strictly a matter of locomotive size, for this is in turn controlled by weight which

bridges and track will support. A sub-committee of the Association of American Railroads in 1939 recommended a conventional type of boiler for a proposed 6400 horsepower high-speed locomotive, and with such a horse power available we can discuss train load either under the head of highest speed or a heavier load at a lower speed.

That is, with this boiler horsepower, the cylinders of the locomotive can be made large and reciprocating parts can be balanced at a certain piston speed. This piston speed is in turn governed by the distance of the main pin from the axle. If this distance is long, the locomotive is powerful, but when high speed is reached the piston travel distance is so long that the reciprocating parts can't move that fast. If the crank distance is shortened the starting power will be less, but at high speed the effort will be continued because the limiting speed of the reciprocating parts will not have been reached. The effort is much similar to the gearing down of an electric motor of given horse power. If the motor is geared down considerably, it will exert a greater pull on the driven shaft, but will do it slower. If it is not geared down so far, the driven shaft will run faster, but will take care of less load.

The lightweight train does not enter into the locomotive problem, although it has affected train performances, especially with respect to speed. The questions of train weight and locomotive performance are really two separate matters, and it is obvious that irrespective of what type of locomotive or what capabilities it has, lessening the weight of train will improve train performance, but not locomotive performance, for the conditions have been changed.

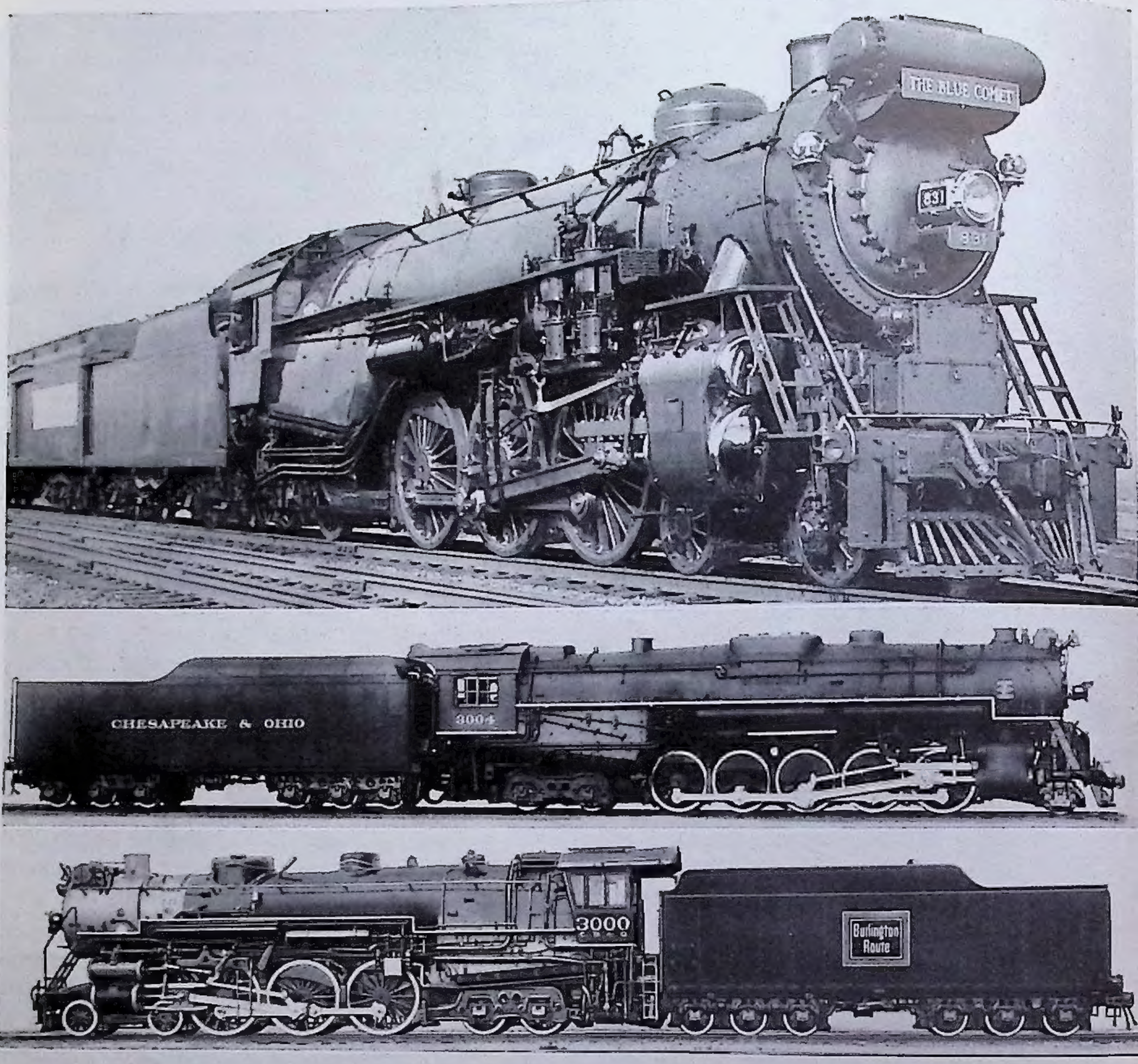
THE availability of locomotives is much discussed, but is as much a matter of scheduling as it is a matter of the abilities of various types of power. The modern steam locomotive has a high availability. For instance, a steam switcher has been run for 30 days without ever getting off the job, by maintaining the fire in good condition. When the crew had 20 minutes for lunch the locomotive was stopped in a convenient location, the ash pan was dumped, and with a mechanism that was available, coal was placed on the tender so that when the crew finished its 20 minutes of lunch time it immediately went back to work.

It is suggested that 30 days' continuous service is about all any practical type of locomotive could be expected to perform. The only reason this particular switching locomotive was taken off the job after 30 days was that the governnment requires boilers to be washed every 30 days.

Average miles per locomotive per month.

A number of railroads were asked to select five or ten locomotives that made the highest total mileage during the month of May, 1940. The following is a brief summary of the leaders as given:

PASSENGER			FREIGHT			SWITCHING		
Steam		Diesel	Steam		Diesel	Steam		Diesel
Coal	Oil		Coal	Oil		Coal	Oil	
		19,848	7284					3988
10,929			9532					4065
10,230			8574			3849		
		19,264	9389			3542		
12,373			7738					3517
14,484			7294					4259
11,293			7680					3804
		24,467		9116				4147
		22,268	7315				4032	
12,358			7387			3653		
	12,754			7111				4289
		10,199	8571					
	11,088		8022					
16,924			7468					
17,321								



Courtesy Central of New Jersey, Chesapeake & Ohio, Burlington Route, Santa Fe.

Road locomotives are, as noted, making long runs. After a long trip the engine is carefully inspected, the necessary adjustments are made, and it is again ready for the same trip. Considering the whole fleet of hundreds of locomotives, the average locomotive is turned very promptly at the end of the trip and returned to work.

The availability is much higher than the actual use obtained because schedules are not made to fit the locomotives, but to fit the needs of the cash customers. It is almost the exception that a run is ready for a locomotive the instant it is turned and available for the road. It should be noted that Diesel locomotives in passenger service have often been assigned to regular runs having short turning times so that the particular assignment enables them to show a high pecentage of use. The high cost of Diesel power makes it more important that units be purchased especially for particular round-trip runs with comparatively short turning time, while steam locomotives are ordinarily assigned to more general service, taking the runs as they come.

Entirely aside from the faster schedules, passenger locomotives will cover more miles per month just because of the greater regularity of assignment, and also because passenger work is more evenly distributed over the 24 hours of the day. Many freight runs are overnight, and if a locomotive arrives at a terminal at 8 a.m., turning it quickly is of no avail if the next freight assignment is at 10 p.m. On the other hand, the North Western can use Diesel locomotives a round trip a day between Chicago and Minneapolis, 421 miles in each direction, because schedules are such that the same locomotive can be used one way on the "*400*," a day train, and the other way on the *North Western Limited*, an overnight train.

The accompanying tabulation of locomotive mileages for a particular month and on railroads selected at random rather than for highest performances shows steam locomotives making 17,000 miles. This is not at all uncommon, and in fact steam locomotives in current use frequently make 20,000 miles a month in passenger service. In freight service it will be noted that locomotives from one road are making 9500 miles a month, which is not uncommon, and in switching service there are 3800-mile locomotives.

Switching locomotive mileage is based on six miles an hour, so that, as the month of May was a 31-day month, it was possible, if the locomotive worked 24 hours every day of the month, to make a switching mileage of 4464. Running 3850 miles represents approximately 86 per cent of the total possible mileage for a 31-day month. Commercial matters again interfere in availability, for sufficient switching is not usually available

C of NJ 4-6-2, Class G-3s.

Drivers, 79″; cylinders, 26″ x 28″; working pressure, 230 pounds; tractive force, 46,841 pounds; weight without tender, 326,470 pounds. Baldwin-built, 1928.

C&O 2-10-4, Class 2104-S-566.

Drivers, 69″; cylinders, 29″ x 34″; working pressure, 260 pounds; tractive force, 91,584 pounds; weight without tender, 566,000 pounds. Built by Lima.

CB&Q 4-6-4, Class S-4.

Drivers, 78″; cylinders, 25″ x 28″; working pressure, 250 pounds; tractive force, 47,700 pounds; weight without tender, 391,800 pounds. Baldwin-built, 1930.

AT&SF 4-6-4, Class 3460.

Drivers, 84″; cylinders, 23½″ x 29″; working pressure, 310 pounds; tractive force, 48,300 pounds; weight without tender, 409,000 pounds. Baldwin-built, 1937.

on Sundays and holidays to require full use of a locomotive, and therefore, while the switching locomotive was in use 86 per cent of the time, it was available for use possibly 98 per cent or even 100 per cent of the time.

The figures given in the tabulation are not supported by any data as to why they are not higher, or as to why they are as high as they are. This is simply the data which shows up in the normal operation of the railroad, the units providing regular service, and in the case of steam, not supported against contingencies by other units. A check was made of passenger steam locomotives handling through trains on about a 900-mile run, and during a month it was found that 92 per cent of the engines leaving the original terminal arrived at the final terminal. This was actual performance, not making any allowance for the fact that many times locomotives were taken off due to operating convenience, so that 8 per cent does not by any means indicate a total of that many mechanical failures. In fact, the 92 per cent figure on a 900-mile run indicates considerable reliability in the steam motive power units now in use.

With faster and faster timing between distant cities, the possible length of non-stop runs assumes an importance which must be considered along with availability, maximum speed, length of locomotive run, and so on. If the time for slowing down and accelerating the train be included, a stop from a speed of 90 or 100 miles an hour loses many valuable minutes, so that high speed requires first of all the minimum number of stops for any reason. This includes stopping to refuel the locomotive with either coal, oil, or water, or to dump ash pans and clean fires. These stops become of greater importance as the number of trains moving and following each other on the railroad increases.

The inexperienced may not realize that the steam locomotive consumes much more weight of water per mile than it does coal. For instance, a passenger locomotive normally will operate 20 miles per ton of coal, which means 100 pounds a mile, but the same locomotive will use about 100 gallons, or 800 pounds, of water per mile. Eight times as much water as coal makes it expedient to give attention either to scooping water en route, or, if there are no track pans, using a larger water tank in the tender or even an extra water tank car on long-distance runs.

Locomotives can be coaled fast, but no one has yet invented a way of taking coal on the fly. Thus it becomes apparent that a locomotive tender can be built to carry coal sufficient for a long run, but water for only a portion of the run, depending on taking water on the fly or at stops which are necessary for other reasons. The New York Central Mohawk type engines, for instance, have tenders for 15,500 gallons of water and 43 tons of coal, enough fuel to evaporate approximately 5 times the water capacity.

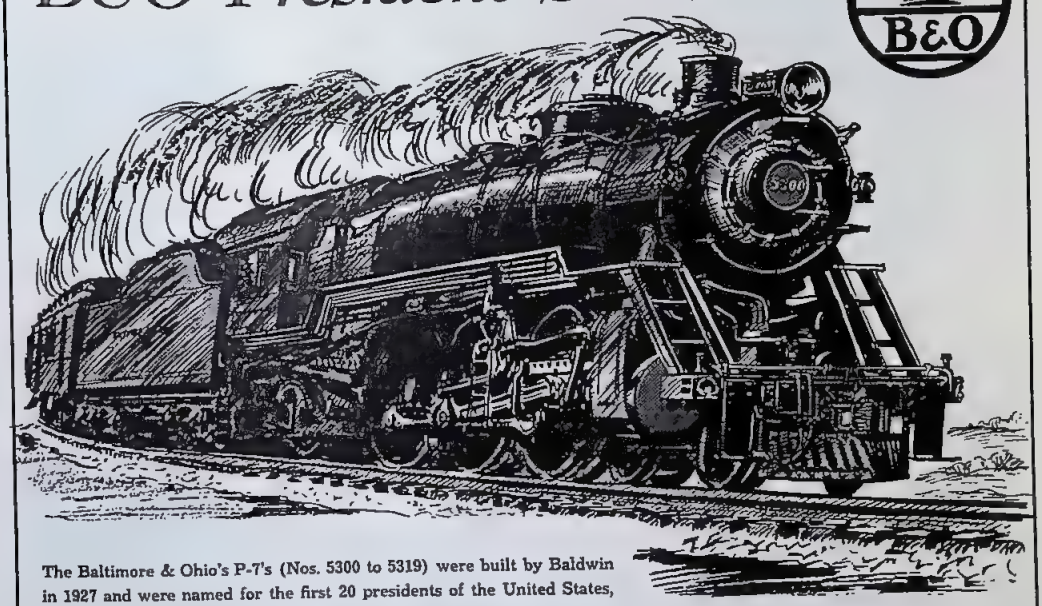
This matter was discussed before the Western Railway Club two years ago, and at that time figures were developed to show that it would be economical on some long high-speed runs to carry as much as 65 or 70 tons of coal, and, if water were scooped, the total weight of the tender would be within modern limits. In other words, there are tenders of that size in use, although now the capacity is used to carry an amount of water more closely in balance with the coal capacity, with the idea of stopping to replenish both water and coal.

The controlling factor, then, is whether it is possible to stop and take supplies without affecting the schedule, whether it is worth while to install a track pan on the railroad right of way, or whether station facilities can be provided so that while a train is stopped anyway, 20,000 or 25,000 gallons of water can be run into the tank. Consideration must also be given as to whether coaling facilities can be provided where the locomotive necessarily stops to change crews or for other reasons, or whether it is practical to carry a large supply of coal sufficient for the run.

The locomotive itself is not the limiting factor in non-stop runs. The limit is set by the facility of supplying fuel and water. This is one point where oil comes in handy, because greater mileage can be obtained from a given weight of oil than from the same weight of bituminous coal.

We may expect that for many years to come the steam locomotive will continue to play a big part in our transportation. We can see from the many factors affecting locomotive performance that choice of motive power cannot be reduced to a generality, that one cannot say "Steam is best" or "Diesel is best." The measure of each particular job must be taken, and in many cases it has been found and will continue to be found that the modern steam locomotive is the answer.

B&O President Series



The Baltimore & Ohio's P-7's (Nos. 5300 to 5319) were built by Baldwin in 1927 and were named for the first 20 presidents of the United States, Washington to Arthur.

Although used primarily between Washington, D. C., and Jersey City, N. J., P-7's are occasionally run to Cumberland, Md. Fifteen of the locomotives are painted Pullman green with gold and auxiliary red striping. The remaining five are royal blue.

With the exception of No. 5314, which has a booster to give it a rated tractive force of 60,900 pounds, all of the President locomotives are rated at 50,000 pounds.

Cylinders, 27" x 28" Length, engine and tender, 87'-10½". Maximum height, 15'-5" Weight, 544,000 pounds. Coal capacity, 19½ tons. Water capacity, 11,000 gallons.

GIL REID

Courtesy Cincinnati Chamber of Commerce.

Bemuraled rotunda is place for ticket windows, soda shop, drugs.

Walls of the Cincinnati station are decorated with the work of artist Winold Reiss, which has been reproduced in mosaic form. The rotunda is a semicircular hall from which passages lead to trains, taxis, etc. If you whisper near the bubbler (Cincinnati English for drinking fountain) at one end of the rotunda, you can be heard 'way at the other end because the curved walls of the room reflect the sound like a lens focuses light.

Cincinnati Union Terminal

★ This utilitarian monument to civic pride costs $1.20 for every passenger using it.

By M. D. Thornburgh.

For a quarter century leading citizens of Cincinnati dreamed and talked about a centralized union passenger station to supplant the five separated, dingy, dirty, and outmoded stations which served the Queen City's seven trunk line railroads. Because Cincinnati is an important junction point between the North Central states and the South, these citizens felt that traffic warranted centralized facilities. But talk was as far as the project progressed until a group of influential public spirited men, headed by George D. Crabbs, made definite plans.

Before any new station could be built, the idea of having it had to be sold not only to the people of the city but to the railroads which would use it—the Baltimore & Ohio, Big Four, Southern, Louisville & Nashville, Chesapeake & Ohio, Norfolk & Western, and Pennsylvania. A big, new monumental station may be a civic asset, but the railroads have to pay for it and the cost is high. The Cincinnati Station costs approximately $1.20 for every passenger using it. Compensating advantages must be shown.

Negotiations were carried on for almost four years before a company was formed to construct the terminal properties. In August, 1929, the first spadeful of soil was turned.

The site chosen was in the Mill Creek bottoms, approximately a mile and a half from the center of the city, partly on ground occupied by railroad yards and certain industries, and partly on waste land used for the disposal of rubbish. Under the supervision of Col. Henry M. Waite, chief engineer of the construction company, contracts were let to a firm of architects and contractors, and work began in earnest.

Plans prepared by the architects called for a complete terminal layout to handle all passenger trains of the seven roads. They included station, express, mail, yard, and locomotive servicing facilities, covering an area of 287 acres. Twenty-two separate and distinct buildings were planned and constructed at a cost of 41 million dollars, and 94 miles of track was laid before the project was completed. The terminal was dedicated March 31, 1933, a little less than four years after actual construction started.

Considerable preliminary work was necessary in the way of filling and grading Mill Creek Valley. About 5½ million cubic yards of fill material was taken by train and truck from an adjacent hill called Bald Knob. Special spurs to Bald Knob were built off the line of the C&O of Indiana to accommodate the soil train traffic. Nearly a quarter million cubic yards of concrete was hauled by rail and truck, not including the 100,500 square yards of paving.

Another part of the terminal project which should be mentioned is the double decked 3500 ft. Western Hills Viaduct, costing 3½ million dollars, built jointly by the Cincinnati Union Terminal Co., the B&O, and the city of Cincinnati to carry the vacated Harrison Ave. across Mill Creek Valley.

The approach to the terminal station along Lincoln Park Drive was carefully planned by both the company and the city to afford not only beauty but facilities for speeding traffic. Lincoln Park, which the station faces, was entirely reconstructed and landscaped to harmonize with the beautiful new building.

Much thought and care was given to the construction of the plaza, and provisions were made for every type of vehicle necessary to service the station traffic. A private entrance is provided for buses and taxicabs, while private cars may drive directly to the main entrance and thus be segregated from public conveyances. A garage where those driving to and from trains can store their cars is

*With the assistance of W. R. Kellogg, manager, and H. R. Conover, real estate agent, of the Cincinnati Union Terminal Co.

Linn H. Westcott.

Cincinnati Terminal joins the ends of many radial tracks.

The terminal is indicated by a white rectangle just west of the downtown area. Most of the railroads leave it via the Ohio River banks or north through the valley of Mill Creek. Initials indicate: B&O, Baltimore & Ohio; CCC&StL, Big Four (NYC system); N&W, Norfolk & Western; C&O, Chesapeake & Ohio; C&O of I, Chesapeake & Ohio of Indiana (used only by local passenger trains); C&W, Cincinnati & Westwood (operates a hand car to keep its franchise); CNO&TP, Cincinnati, New Orleans & Texas Pacific (city owned, leased to Southern RR.); L&N, Louisville & Nashville; CG&P, Cincinnati, Georgetown & Portsmouth (abandoned before it got there); CH&D, Cincinnati, Hamilton & Dayton; CL&N, Cincinnati, Lebanon & Northern (Pennsy system). PPC&StL is also Pennsylvania. Trolley and interurban lines are indicated in black. The famous Cincinnati & Lake Erie was the right of the two lines running off top left. Dash-dot line is route of the never-operated subway and rapid transit built in the bed of a canal.

located below the station building and is reached through the taxicab entrance.

In the center foreground of the plaza is an illuminated cascade, fountain, and pool, provided in lieu of the lake formerly situated in Lincoln Park.

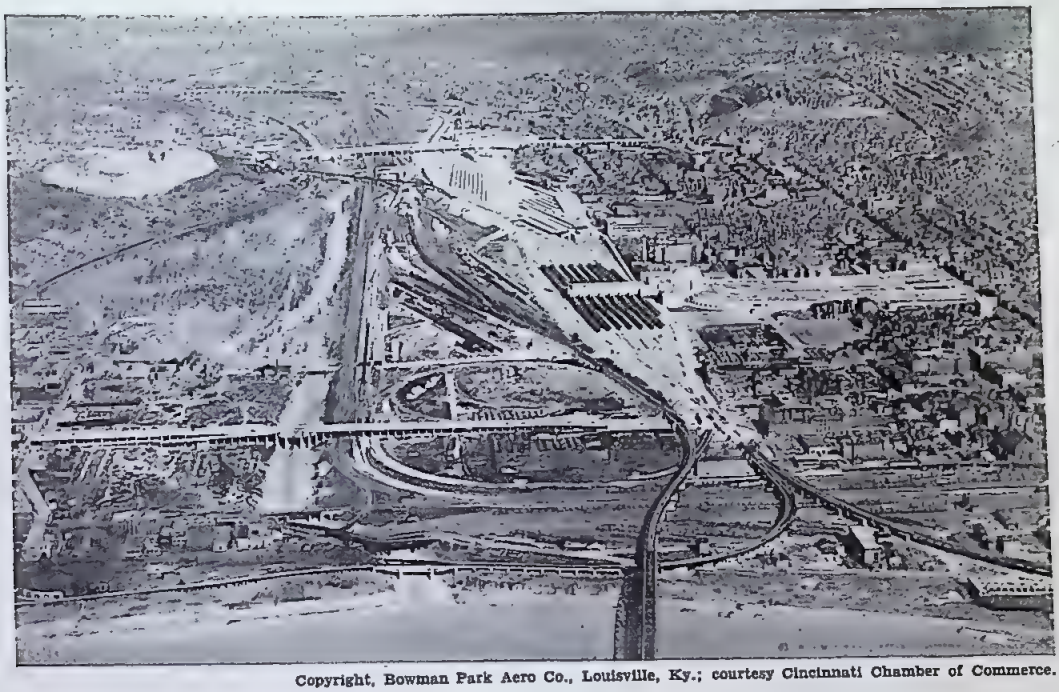
The building itself is an imposing and substantial structure built of Indiana limestone in the conservative modern style, and its position on the rise at the end of the approach dominates the whole scene.

The main concourse is a large and impressive semicircular space whose dome rises 106 ft. above the floor. Around its walls, high up and in clear view, are mosaics depicting the progress of both rail and water transportation from early times until the present. At the base, to the left, are entrances to the bus depot and cab rank, and various stalls for the sale of travelers' goods and refreshments, a newsreel theater, etc., while to the right the ticket windows are conveniently at hand.

The great expanse of glass across the front of the dome floods the concourse with ample daylight. At night the illumination is by indirect lighting. Flood lights concealed behind ledges add to its effectiveness.

Leaving the main concourse, through a lobby, facilities are found for checking baggage and parcels. Here also are the rest rooms, a barber shop, and the entrance to the offices of the Terminal Co. located above the concourse.

The train waiting room is in the rear of the building extending westwardly, overhanging the tracks. It is some 450 ft. long and approximately 80 ft. wide, and spans the 16 lines and eight platforms below. The platforms are reached by ramps and stairways leading from either side of the waiting room. Be-



Copyright, Bowman Park Aero Co., Louisville, Ky.; courtesy Cincinnati Chamber of Commerce.

Terminal from South.

This is the terminal area of Cincinnati as seen from the south (over Kentucky). The Ohio River and the bridge of the Southern system are in the foreground. Just above are the B&O yards and the elevated wye tracks. The terminal proper is in the center; beyond are freight, express, and engine facilities. The properties are on reclaimed land in the Mill Creek area, some of which may still be seen near the left. Dirt from the hill at the left was used for the filling of embankments.

tween 18,000 and 20,000 persons pass through the waiting room every week day.

Murals depicting 12 representative industries of Cincinnati adorn the walls of the waiting room. The cartoons for these were designed by Winold Reiss and are executed in forceful colors, adding greatly to the beauty and symmetry of the hall.

A central power plant, situated a mile away, supplies steam for heating and other purposes. The electricity used annually by the terminal group is said to be enough to supply the needs of a residential city of 60,000 population.

While the station layout is a through one, capable of handling 216 trains a day, the B&O is the only line operating a through train service. All of the other roads terminate at Cincinnati. The 16 tracks comprising the layout fan out from two throats, one situated at the north end, connecting with the B&O line (over which trains of the B&O, Big Four, N&W and Pennsylvania operate), and the other at the south end, branching into three separate connections—one to the Southern, a second to the C&O, and a third to the B&O and Big Four to the west. Another connection leads to the C&O of Indiana at about the middle of the layout.

The 175 governing signal arms, 40 double slip switches and 70 single switches, actuated by 192 switch machines, within the range of the depot are controlled by a Union Switch & Signal Co. electro-pneumatic lever frame containing 231 levers, 187 of which are actual working levers. The brain of the great body of tracks, this lever frame is located in a specially built, light and airy tower atop the rear of the station building. Special treatment was rendered the tower in construction to make it noiseproof.

Directing the manipulation of the levers by levermen, two train directors control the movements of trains in and out of the station with a complete train starting system installed by the Union Switch & Signal Co. as a part of the main signaling installation. A board on the train director's table displays rows of colored lights which are repeated on suspended signals above each platform. About two minutes before train departing time the

Courtesy Cincinnati Chamber of Commerce.

Waiting for the green.

Trains at Cincinnati are started with a system of buttons and lights involving an okay from conductor, train director in the tower above, and gateman. Engine is B&O Class P-5a Pacific, built in 1919.

conductor presses a button located on one of the columns of the platform. This lights a red light on the train director's board in the tower and at the platform gateway in the concourse. The director acknowledges this signal by flashing a yellow light which extinguishes the red lights. At departure time the gateman flashes a light signaling that all passengers are loaded, which registers green at the gate, on the train director's board, and at the platform. When the train has departed the director clears all the signals.

Movements of all incoming and outgoing trains are followed by a lighted model board containing a facsimile of the layout suspended above the lever frame. This shows the condition of all signals, switches and tracks, and whether or not the latter are occupied.

Intermediate sidings are placed conveniently between certain tracks comprising the station layout for the purpose of running around standing trains and for storing Pullmans and other cars while waiting to be switched to and from connecting trains.

The power group—a 20-stall roundhouse with attendant turntable and machine shops, central boiler house, coaling dock, water stations and yard service building—is a mile north of the station and is reached by convenient leads. Between the power group and the depot, at the right, looking south, are the mail and express buildings served by sidings. The coach yards, to the west, lie between the two main lines leading to the north and east on the one side, and the leads to the run-around track on the other. The run-around track circles the roundhouse to enable complete trains to be turned without uncoupling.

Facilities are present in the roundhouse to handle all kinds of light running repairs to the locomotives of the six lines stabled there. Each stall and most of the outside ready tracks are equipped with steam lines for filling the boilers of locomotives by the direct steam method. The engine house is also equipped with special illuminating devices to enable work to be carried out under any prevailing condition.

The coaling plant, south of the roundhouse, is located so coal can be delivered to locomotives on four inbound tracks. Its bins will store 700 tons of coal and approximately 150 tons of sand. Adjacent to the coaling station are four ash pits, electrically operated. The washing rack and inspection pits are situated farther along the leads to the north. Batteries of lights enable inspectors to catch the slightest bad order even after dark.

The coach yard is made up of 26 tracks averaging 1300 feet between clearance points. Passenger equipment of all roads excepting the Southern is stored and serviced at this point. Necessary light running repairs are made in the small four-track repair yard which adjoins the coach yard to the west. At the east side, to the north, is the yard service building. This contains the necessities for complete service of passenger cars, and the commissaries of the Pullman Co. and six roads.

The United States Mail and Railway Express Agency buildings lie to the north of the station and east of the coach yard. Stub sidings ladder off a lead into the platforms, built door high, designed especially for handling express and mail traffic without undue delay.

Many famous named trains leave the Cincinnati Union Terminal. Among them are:

The *National Limited* of the B&O (New York to St. Louis). Pulled by two Diesel units, it normally consists of six Pullmans, observation lounge, diner, reclining-seat coach, buffet coach lounge.

The *Diplomat* (B&O, New York to St. Louis), pulled by a U. S. R. A. light Pacific. It usually consists of six cars plus baggage and mail: two Pullmans, lounge-observation, diner, reclining-seat lunch counter car, combine coach.

The *Royal Palm* of the Big Four and Southern (Chicago-Florida), using a Hudson for motive power on the Big Four and a 4-8-2 on the Southern. It carries four Pullmans, two coaches, and lounge, plus baggage and mail.

The Big Four's *Ohio State Limited,* operating between Cincinnati and New York. Handled by a Hudson, it usually carries four Pullmans, lounge, diner, and coaches as needed.

The Southern's *Ponce de Leon* and *Carolina Special,* which leave Cincinnati as one train, usually headed by two 4-8-2's. The normal consist is eight Pullmans, four coaches, baggage, and mail.

The L&N's *Pan American* (Cincinnati-New Orleans), which uses a 4-8-2 to haul its lounge, one or two Pullmans as needed, two coaches, and mail and baggage.

The *Southland,* handled by Pennsylvania between Chicago and Cincinnati, and by L&N between Cincinnati and Florida. Pennsy uses a K-4s; L&N a 4-6-2 or a 4-8-2. It usually consists of two coaches, three Pullmans, diner, observation, and mail and baggage.

The C&O's *George Washington* (Chicago-Washington), consisting of observation, three or four Pullmans, diner reclining-seat coaches, regular coaches, baggage and mail, pulled by a 4-6-2.

The *F. F. V.* (C&O, Cincinnati-Washington), which also uses a 4-6-2. Its usual consist is lounge, three or four Pullmans, diner, reclining-seat coaches, regular coaches, baggage and mail.

The *Pocahontas* (N&W, Chicago-Norfolk), using a 4-6-2 or 4-8-2 to haul its two Pullmans, diner, reclining-seat coaches, baggage and mail.

Top courtesy Baltimore & Ohio, others Cincinnati Chamber of Commerc

Modern Classic Terminal

Night and day, Cincy station is a dominant feature in the ex-slum area. Center photo shows miniature movie theater provided for use of waiting passengers. The station was provided with trolley connections, never used.

The *Cavalier* (N&W, Cincinnati-Norfolk), which usually has about the same consist as the *Pocahontas.*

The *Union* (Pennsylvania, Chicago-Cincinnati), pulled by a K-4 and consisting of dining lounge cars and coaches.

Eastern & Western Trains

★ Chicago & Eastern Illinois freight engine 1933;
Atchison, Topeka & Santa Fe
Chief double headed.

C&EI serves the Illinois coal regions.

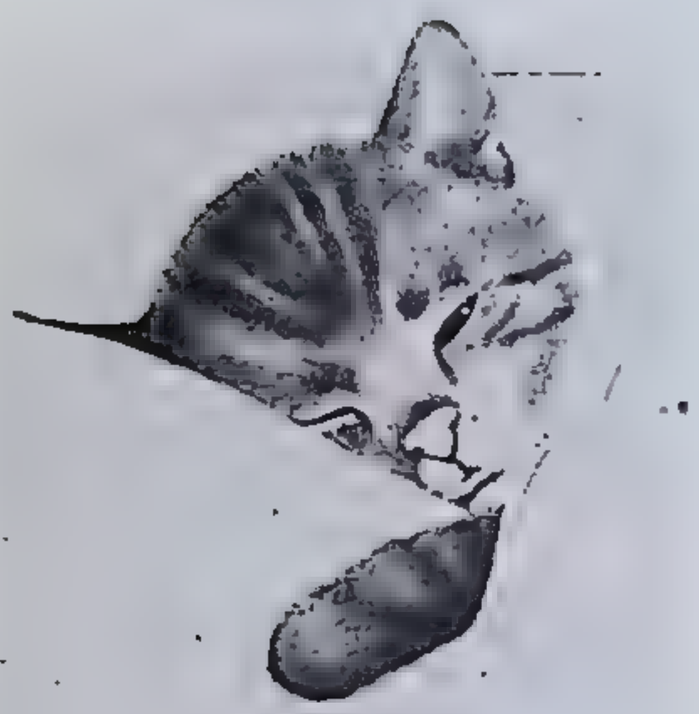
Here is Chicago & Eastern Illinois' engine No. 1933 about to rattle a string of freight cars over the crossing with the Baltimore & Ohio southwest of the city of Salem, Ill. The crossing is protected by mechanical interlocking, which accounts for the clear board after the train has passed the signal. Were this an electro-mechanical or all-electric interlocking the signal would be "slotted." This means it would automatically return to the normal danger position as the train passed it. This track is the important line to the southern Illinois coal fields, terminating at Chaffee, Mo., and Joppa, Ill. Over it are run four daily passenger trains, all locals, and many freight drags. C&EI main lines run from Chicago to St. Louis and to Evansville.

M. B. Cooke, 9 Grant Ave., Jersey City, N. J.

Railroad Photographs, by Lieut. E. W. Bewley.

Santa Fe in action, Cajon Pass.

The Atchison, Topeka & Santa Fe is the only railroad that runs its own trains behind its own locomotives on its own track all the way from Chicago to California. Santa Fe misses many of the great mountain ranges that impede other routes, but Cajon (pronounced *Kah-hone*) Pass is a major achievement in engineering. Southern California is a series of valleys and plains connected by low passages between the hills. Along the north rim is the Sierra Madre mountain range. Eastbound Santa Fe trains follow this range 60 miles from Los Angeles to San Bernardino, then turn north and dive in. The line emerges onto the rim of the Mojave *(Mo-hah-vee)* Desert after climbing 25 miles of winding track. This is the *Chief* third section, double-headed with an Atlantic, 1468, and a Mountain type, 3272, for the 2½ per cent grade. It is nearing Alray station in the rain. If you spend the night near the main line of a Western transcontinental like the Santa Fe, you will learn a very interesting thing about long distance traffic. Trains on these lines are run in great bunches, each a few minutes after the other. This may go on for hours, all eastbound trains, then a swarm of westbounds starts coming, but during some parts of the day there may not be a wisp of smoke in a hundred miles or more.



Chessie

★ Chesapeake & Ohio's little sleeping
Cheshire gets fan mail
and catnip mice.

"CHESSIE," the glamorous kitten publicized and popularized through the advertisements of the Chesapeake & Ohio Ry. Co., was the innovation of the late L. C. Probert, who was a vice-president of the road. Chessie made her first appearance through the medium of a colored etching by G. Gruenewald, gifted Viennese artist. Captivated by her languorous charm, Mr. Probert arranged for her more public introduction through the medium of the C&O ads.

That was in 1933. Chessie won instant popularity. She was "starred" in the 1934 calendar of the road and, from that time on, she appeared prominently in various forms of C&O promotion — magazines, newspapers, booklets, billboards, and even games.

Chessie has sustained her popularity over a period of seven years. She has her following like some of the gelatinized animal creations of the Walt Disney studios. Numerous fans have followed her "adventures in contentment" from birth through marriage and motherhood.

She gets fan mail. Boys, girls, and grown-ups write to her, inquiring about her whiskers; her old man, "Peake"; her offspring; and what not. Some kindly disposed admirers have sent her catnip mice. Others have written enviously about the soft life she leads, tucked under immaculate sheets and fluffy blankets, purring in her sleep while others toil.

Chessie is a much-traveled celebrity. Because of the neon glow to her personality, her portrait has been in great demand. She has left her picture behind her in 22 foreign lands. She is known from Patagonia to the Hindu Koosh.

This popular kitten has become quite an asset in the development of good will and patronage for the C&O. There are on record instances of business being attratced to the road because of the favorable regard entertained for Chessie by shippers and passengers. Her somnolent moods picture to travelers, better than words can, the importance of restful ride and invigorating sleep. But she is something more than a symbol of repose; she has a by-product of usefulness and significance. Her likeness on the backs of playing cards is regarded by many bridge addicts as an augury of luck. Juvenile collectors of playing cards, match covers and other mem-

Peake, Chessie's "old man."

The entire Peake family appeared together on the 1940 calendar.

Chessie first appeared alone, then with two kittens. Soon Peake came around to survey the situation, and last year the whole family was portrayed in a single picture, above. Calendars for 1941 show Chessie floating in the clouds of night, and 'way below on earth a softly glowing string of C&O Pullmans glides over shining rails, protected by automatic block signals. Chessie has graced other literature besides the calendars. There is a guide for the patrons of the C&O called *Chessie's Travelog*; a game, *Chessykat*; a *Chessie's Portfolio*; and, of course, a score of ads that appear in the national magazines. The first week of the 1941 calendar brought over 10,000 requests for copies. Many were from foreign countries, from embarrassed, apologetic cow hands, from ministers and from teachers. After hanging a Chessie calendar the dean of a Michigan school wrote, "The only hazard we fear is that the students will be enticed to leave school and travel under conditions so alluring." Perhaps they will be satisfied just to stay and look at the calendar.

orabilia of youth find that Chessie cards command a premium in the barter market.

A New York newspaperman has written that his young daughter "has the edge on her pals by having one of the old Chessie decks to swap, for Chessie backs bring quite a premium." He adds: "Kids didn't do it when we were young, but now they swap playing cards and get sets of attractive backs to mount in scrap books like match covers."

The first Chessie calendar was distributed free to anyone who asked for it. The demand became so great and so far-flung that the road decided to ask those desiring a calendar to submit 25 cents to cover postage, handling costs, etc. This seemed to enhance the value of the annual calendars and actually increased the number of requests. Editions of the calendars, for the past three years, have been complimentary. Copies go primarily to shippers, passengers, ticket agents, travel bureaus, libraries, etc.

The question of whether it is Chessie's tail or paw sticking out from beneath the covers has been answered. It's her paw, with claws retracted. Chessie is completely relaxed.

Denver Railfan

★ R. H. Kindig records Colorado railroading with an eye for action and beauty.

Most of us would admit that the Denver country is just about tops for railroad interest in the mountains. There's the Moffat Road and Tunnel, what's left of the C&S narrow gauge, and massive D&RGW power and its narrow gauge lines. On the plains, running right into Denver, is shooting ground for Santa Fe, Burlington, Rock Island, and Union Pacific trains, not to mention the interesting Great Western RR. in the sugar beet country nearby.

Denver railfan Richard H. Kindig knows this country and doesn't let many of its picture possibilities slip by: Up early a frosty Winter morning to chase the stumpy C&S engines up to Idaho; riding the crummy of a Rio Grande through the Black Canyon to Cimmaron; standing by the UP main in Wyoming to watch the parade of big power pound the high iron. Union Pacific is Kindig's favorite, at least of the standard gauges, and for a good reason, too: His father, C. A. Kindig, is a conductor on the Colorado Division of the UP, and he has told R. H. stories about and taken him for rides on the railroad as far back as he can remember.

In 1934 Kindig started taking railroad pictures with an old 116 size Kodak, top speed 1/100 second. After a couple of years of gradually increasing interest in engine and train

Union Pacific's *Los Angeles Challenger* speeds Eastward.

This photograph of second 818 was taken last December near Archer, Wyo. Engine 820 is a 4-8-4 and its tender is equipped with the new bed taking five axles. Some men call this type of tender "caterpillar."

R. H. Kindig, 3831 Perry St., Denver, Colo.

Hi-ho, Kindig!

The iron horse is power on the live steam model railroad of R. B. Jackson, Beverly Hills, Calif. The jockey is R. H. Kindig, hero of this saga. The center picture is of engines 8-M-1 and 8-M-2 arriving at Denver with the *Pacific Limited* from Kansas City. Bottom, a five-car D&RGW narrow gauge passenger train (Salida to Gunnison via Marshall Pass) is shown climbing toward Mears Junction above Salida. This train has been discontinued.

R. H. Kindig.

photography, it became apparent that the 1/100 second was unsatisfactory for the kind of action shots he liked, so he started looking for a faster camera. Finally he became owner of a post-card size Graflex, with an f:4.5 Bausch & Lomb lens and speeds up to 1/1000 second. He now has over 3000 negatives in his collection, and estimates that there must be between 8000 and 10,000 prints in his files. His better shots are also taken in color with a 35 mm. camera, but the color collection is still relatively small.

Besides his UP interest, a good deal of Kindig's train photography has been done in the Colorado Rockies. During 1937 and 1938 he concentrated on the narrow gauge line of the Colorado & Southern Ry., realizing that these photos would soon be unobtainable due to the rapid abandonment and dismantling of the line. Some of his favorite pictures were taken in the vicinity of the Georgetown Loop, abandoned and dismantled early in 1939. A typical day would be spent taking a series of photos of the same narrow gauge train, snapping, then driving ahead to the next scenic spot for another picture. On one such trip he followed a 3-foot gauge double-header all the way from Denver to Silver Plume and back, netting 69 negatives. At present, besides the narrow gauge lines and the UP, he is interested in Southern Pacific, Denver & Rio Grande Western, and any Western short line. He uses Super-XX film exclusively, and although he does not develop his films he does all his own printing.

Kindig's pictures are almost always very sharp, with good tone separation. Most of the ones we've seen are of trains at speed or pulling a heavy drag against a very well chosen background. Many expeditions are made with

friends and other Denver railfans. One highlight was the trip taken by Kindig, John Maxwell, and Mac Poor of Chicago recently. Poor is an authority on the old South Park Line (Denver, South Park & Pacific), so part of the trip was spent investigating the remains of the Alpine Tunnel by which the old narrow gauge crossed the Continental Divide. Another day was spent riding a Denver & Rio Grande Western caboose, and then they followed a train from Durango to Silverton.

Since R. H. works a five-day week for the Western Electric, a telephone manufacture and repair company, he has a two-day week end to spend taking pictures when he likes. This should be a banner year since Memorial Day, July 4, and Labor Day all will make a three-day week end. Besides taking photos, Kindig trades with other rail photographers for different prints of his own favorite roads. He has many from G. M. Best and H. R. Griffiths.

R. H. Kindig.

Engine and helper near Mitchell.

This Denver & Rio Grande Western freight is breaking the silence of the Sawatch Mountains just north of Tennessee Pass. Engine 3602 and helper 3605 are Class L-131, 2-8-8-2 articulateds. Their combined tractive power, 263,600 pounds, moves this 48-car train up the 3 per cent grade at 15 miles per hour. The old narrow gauge line zigzagged from side to side in this valley and did not go through tunnel at the summit. Taken March, 1940.

Railroad Photographs, 47 Royal St., Allston, Mass.; by William J. Pontin.

One of three tunnels at Gallitzin.

Pennsy fast freight, behind an M-1a Mountain type, dives into the west portal of the double-track New Portage tunnel at Gallitzin, crest of the Alleghenies. This bore was originally part of the New Portage RR., route of Pennsylvania trains before Horseshoe Curve was built in 1854. This tunnel, and one of the single-track bores, dates from 1852 and is 1630 feet long. Both single-track tunnels are 3612 feet long. One was built in 1852 and the other in 1904. Connection is still made just east of the tunnels with the New Portage RR. route, which gives the Pennsy an alternate route, south of the main line and around Mule Shoe Curve, to Altoona.

Horseshoe Curve

★ Scenery and trains make the P RR. near Altoona a Mecca of railroad interest.

*By Harry T. Sohlberg.**

THE brakeman calls out, "Horseshoe Curve on your right in a few minutes." The deadheads don't even look up, but nearly everyone else in the coach crowds to the right hand side to get a good look, for this scenic wonder of the Pennsylvania RR. main line is well known to every traveler and would-be traveler. That the curve is no less an engineering attraction is usually lost sight of, but this wide sweeping horseshoe allows the Pennsy's Pittsburgh Division line, four tracks wide, to breast the east slope of the Alleghenies with only 92 feet per mile grade.

What better spot than here for the man who likes to watch or photograph trains! Westerners can well be proud of their famous Cajon Pass in the San Bernardino Mountains, the fabled Moffat Tunnel in the Colorado Rockies, or Sherman Hill in Wyoming, but Horseshoe Curve has everything to make the true railfan happy. It is on the Harrisburg-Pittsburgh portion of the Pennsy main line, funnel for the traffic from Chicago and St. Louis to New York and Washington, a line which is never without the thrilling sound of locomotive exhaust.

Two engines on the front, two on the rear, the heavy freights roll up the line from Altoona, around the horseshoe, to the tunnels at Gallitzin, the crest of the Alleghenies. Light engines glide gracefully down to Altoona, there again to take up their task of helping to lift thousands of tons over the 2200-foot summit. Long freights roll down, brake shoes telling the story of retainer-set cars helping to hold the immense potential energy in leash.

Day or night the story of heavy traffic railroading unfolds. The night owls can watch a show unequaled anywhere, as the great steel fleets of main line limited passenger trains from East and West cross and recross the center tracks, sparks flying from stacks of westbound locomotives, sparks from brakes of eastbound trains. The timetable reveals a delightful concentration of traffic. During the five hours from 10:43 to 3:41, 27 named trains, including some of the most famous in the country, round the curve, and on fine Summer evenings nothing could be pleasanter than watching this parade from a car parked on the public highway below. Here are the heaviest hours listed in detail:

Time	Train No.*	Train Name
10:43	49	The General
10:49	69	The Red Arrow
11:08	41	Cincinnati Limited
11:09	52	The New Yorker
11:23	59	Liberty Limited
11:33	77	The Trail Blazer
11:46	31	Spirit of St. Louis
11:51	29	Broadway Limited
12:32	22	Manhattan Limited
12:54	16	Iron City Express
1:12	66	The American
1:16	23	Manhattan Limited
1:18	76	The Trail Blazer
1:36	50	The Statesman
1:43	60	The Pittsburgher
1:52	38	The Clevelander-The Akronite
2:11	36	Philadelphia Night Express
2:18	70	The Advance General
2:25	40	Cincinnati Limited
2:31	39	The Clevelander-The Akronite
2:37	68	The Red Arrow
2:43	67	The American
2:45	58	Liberty Limited
3:00	30	Spirit of St. Louis
3:19	48	The General
3:34	32	The St. Louisan
3:41	28	Broadway Limited

*As is the usual practice, even numbers indicate eastbound trains, odd numbers westbound trains.

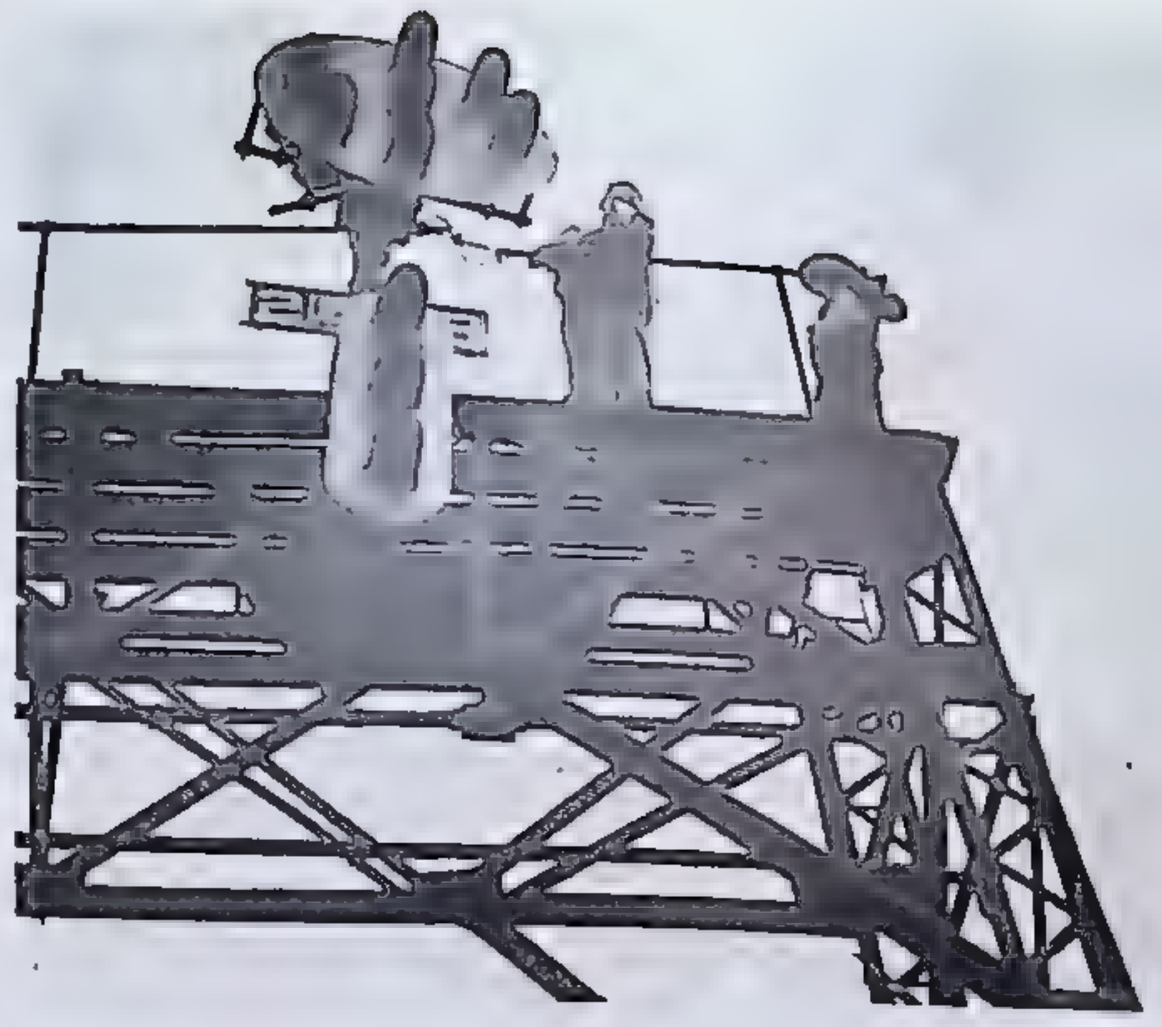
This is truly the great parade! But my associates and I came to this Mecca of railfans with our cameras, looking for daytime action. And there's plenty of that too. Start with us at East Altoona, the front yard of the big mountain workshop of the Pennsylvania RR. The engine house here is one of the largest of its kind in the world. It is a complete circle, with 50 engine house pits, and a capacity for handling 385 locos in a 24-hour

*Executive vice-president, Railroad Photographic Club.

period. Needless to say, it is worthy of more description than we can give here, a whole story by itself sometime.

The same applies to Altoona itself. Bit by bit the entire plant unfolds itself. Juniata shops. Altoona machine shops. Altoona car shops. South Altoona foundries. The test department. The locomotive test plant. All of this lies directly at the foot of the main ridge of the Alleghenies, a true "railroad town" of some 80,000 persons—beehive of super-activity and front door to the far-famed Horseshoe Curve.

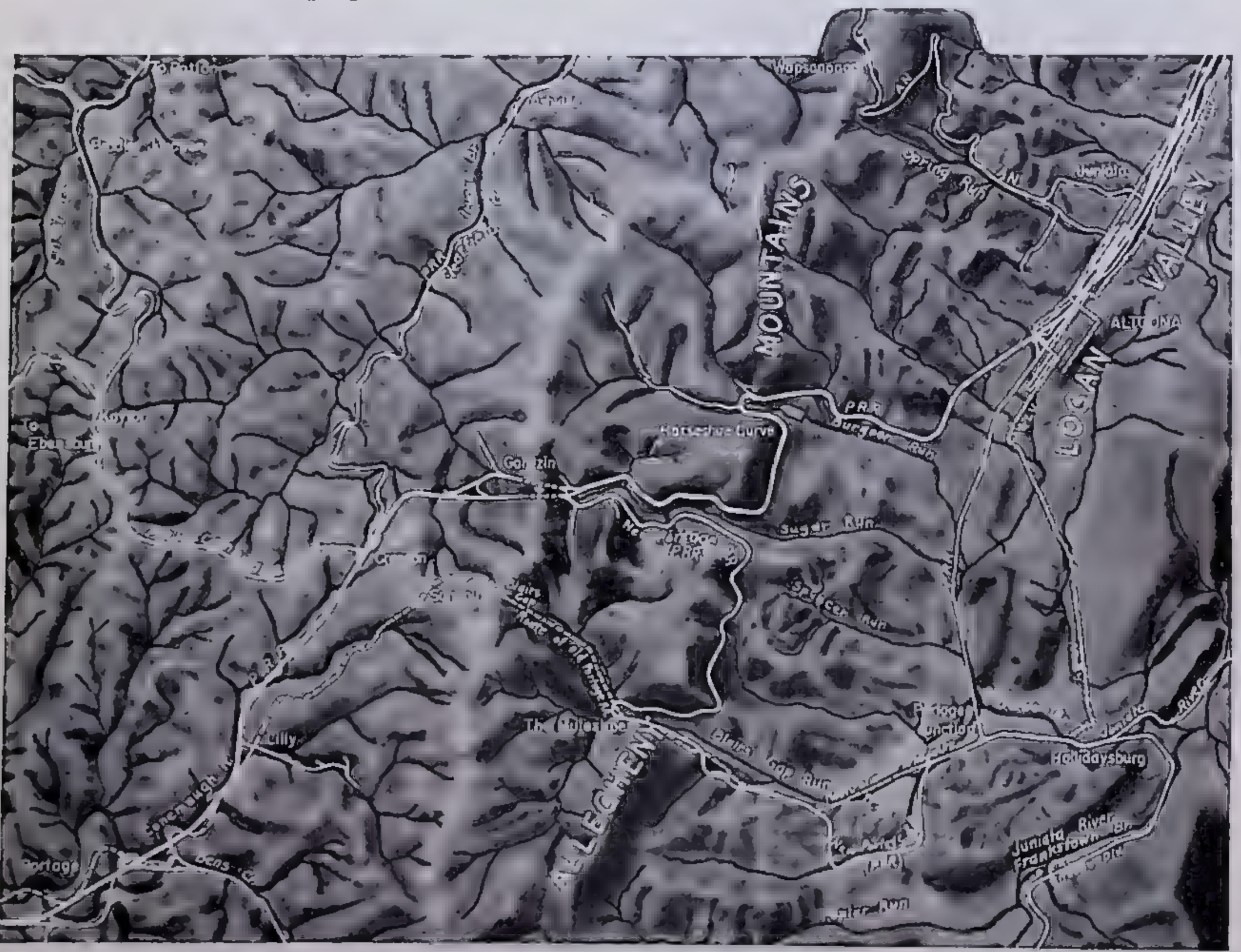
Out of Altoona the average train adds another locomotive, and, in the case of freight drags, two or three engines are added to surmount the heavy grade encountered. From



Railroad Photographs, by H. T. Sohlberg.

Altoona is starting point for many railfan jaunts.

Horseshoe Curve, on the four-track main line between Altoona and Gallitzin, is only one of many interesting railroad features in the area. If you are fortunate enough to ride over the New Portage (P RR.) line from Hollidaysburg to Gallitzin you will wind your way through beautiful scenery up Blairs Gap Run, around the Muleshoe, and then along the face of the mountains, eventually turning into Sugar Run across from the main. The New Portage line was completed in 1852, beating Pennsy iron to the area. It replaced the old Allegheny Portage. The latter was opened in 1834 to carry canal boats over a series of cable-planes connected by levels upon which horse and steam power were used. A good stiff hike would be to follow the old line by foot from Hollidaysburg to Lilly. Many of the ties are still in place. AN is the Altoona Northern RR., abandoned coal hauler; A&LV, the Altoona & Logan Valley interurban, a trolley fan feature. One inch on the map equals three miles.



Linn H. Westcott.

Railroad Photographs, by H. W. Pontin.

Both ends of Horseshoe Curve in one unusual photo.

The signal bridge just west of Kittanning Point station was the vantage point for this view of Burgoon's Run, about which the Pennsy's four-track main line winds to make Horseshoe Curve. Both calks of the horseshoe are in the photo. Notice the eastbound (downgrade) freight train at upper right and the water spouts between the tracks at the left where the line curves around Kittanning Point toward Altoona. The curve itself is behind the cameraman. The water is in City of Altoona reservoirs. The view on the facing page shows H. W. Pontin on the signal bridge (from which the above picture was taken) with a Pennsylvania RR. guide. Below is a Pennsy Mikado, hot in the noonday sun, rolling westward out of the single-track Allegheny Tunnel at Gallitzin, where the main crosses between Atlantic and Mississippi watersheds.

Railroad Photographs, by H. W. Pontin.

Railroad Photographs, by W. J. Pontin.

Altoona to Gallitzin, just west of the curve, Pennsy trains climb 1015 feet in 11 miles, nearly 1.8 per cent average gradient.

For about five miles the initial grade out of Altoona is pounded to the utmost, and further advance seems blocked by the lofty mountains until the train rounds the nose of a projecting spur and the picturesque station at Kittanning Point comes into view. We have reached Horseshoe Curve—242 miles west of Philadelphia and 111 miles east of Pittsburgh.

Construction of the curve was finished early in 1854. It was the last portion of the Pennsylvania's main line between Altoona and Pittsburgh to be completed. The entire line was opened for traffic on February 15, 1854. Prior to that, for about two years, Pennsy trains had used the 28-mile stretch of the New Portage RR. south of the present main line. This line is still used as an alternate route (see map, page 30) and includes the Muleshoe Curve.

We have come out of Altoona by motor car and at Curve Center we turn into a spacious parking area. Well supplied with cameras and equipment, we begin the long, steep climb to track side, where we are met by our guide, previously arranged for by Pennsy officials.

Below us we see the Kittanning Valley and Burgoon's Run; above us tower the Alleghenies, dropping abruptly to line side, forming a giant amphitheater for our scene of action. At Kittanning Point the valley parallel to the road becomes a deep, wide gorge, the south side of which rises to a great height. To negotiate this gorge, after climbing steadily from Altoona, the construction engineers built a line around the head of the gorge and

Courtesy Mutual Magazine, Pennsylvania RR.

Railroad Photographs, by H. W. Pontin.

Brakes smoke on the down grade.

A stock train, opposite page, slides down the grade with its Pennsy Mountain type locomotive pumping air to hold the train under control. The smoke rising from under the cars tells its story of retainer valves which are set to keep the brakes on.

Passenger train on inside iron.

Pulled by K-4's 3733 and 1339, No. 24 slips downgrade on one of the inside tracks. No. 24 is an afternoon maid-of-all-work passenger train from Pittsburgh (11:10 a.m.) to Philadelphia (8:30 p.m.), making practically all of the run's local stops.

along the side of the mountain in the general shape of a horseshoe, hence its name.

The toe of this horseshoe is a gigantic fill across Curve Center, or Burgoon's Run. The curve is what is technically known as a nine-degree curve and extends over a distance embracing 220 degrees. At a point 2000 feet on either side of Curve Center it is 1400 feet across Burgoon's Run. Visualize a real horseshoe and these figures are very easily assimilated.

The southern calk of the shoe is 1716 feet high, and the northern calk, Kittanning Point, is 1594 feet high. If the tracks were to be carried directly across the gap from calk to calk, without the sweep of the shoe and its subsequent fill, it would require an 8½ per cent grade, entailing the use of a cog wheel railroad.

Kittanning Point station, its sign still painted neatly in the familiar Pennsy red and gold, though no longer used for train stops, offers sanctuary from the boiling sun. Beneath its platform we await action—and it is not long in coming!

The sound of barking exhausts heralds the approach of a double-header moving west, and we turn our reflex cameras toward the nose of the point, expectantly, hopefully.

Hotshot freight!

Our catch sports a heavy I-1, 2-10-2 type, as a helper, with an M-1a, Mountain type, on the train. We notice that the I-1 is numbered 4527 as its front end reaches the correct position in our finders. As the helper rolls by we see that the Mountain type has road number 6768. We have time to count 110 cars before another pair of "jacks," the pushers, loom up around the curve. Both are I-1's. (See lower photos, page 31.)

As it was nearly 100 years ago.

Facing page photo shows Horseshoe Curve shortly after it was built in 1854. Below is the top of one of the inclined planes of the original Portage RR., first railroad across the Allegheny summit. Notice the two-section boat.

Courtesy Mutual Magazine, Pennsylvania RR.

It is no trouble for the engineer on the first helper, over on the south shelf, to look across the valley and see his colleagues rounding Kittanning Point.

A smoke plume on the southern end of the shoe attracts our attention as we watch the head end of the freight disappear. Slipping gracefully around the bend, a long passenger train takes things easy as it moves toward Curve Center. This is in accordance with operting department orders, so that all passengers are afforded a good view of the curve, from beginning to end. Such courtesies pay real dividends!

With the signal bridge above the station for a frame, we click our shutters on a pair of K-4's proudly displaying the orthodox white feathers, a sign of intelligent firing. This train is the *Gotham Limited.*

During the morning a steady stream of freight and passenger trains keeps us busy changing film. During our two and a half hours' working time until noon we have cataloged 15 trains, four of which are passenger trains. This does not include returning pushers, merrily clanking down the grade to Altoona to pick up another drag and give it a helping hand.

Lunch in town is out of the question. Too much valuable time would be lost. Preparations for lunch "on location" should be a part of all plans for such an expedition. Our guide gives us much valuable assistance along this line.

This is an ideal time to climb the steel ladder to the working platform of the signal bridge and capture a prize shot, both calks of the shoe on a single plane (see page 27). It is a majestic sweep and should never be overlooked. But, once again, the question of permission creeps in. Properly supervised, the photographer has a wealth of material at his disposal.

After lunch we prepare to move with the sun, the better to catch Curve Center and the south slope. We have no sooner reached our chosen position, placed our equipment, and noted the position of the sun, than things begin to happen all over again!

Fast freight PG-7, hauled by two Decapods, swings around the point and slams it down for the roller-coaster ride across Burgoon's Run and up the west slope. As the loaded cars click by us, further assisted by another pair of I-1's, we are jolted into immediate action by the sight of two Mountain types rolling past Kittanning Point station.

With the freight on the outside iron, the *Metropolitan,* crack passenger flyer for the West, puts on a magnificent show as it rapidly overhauls the freight pushers. Exactly at Curve Center, before our very eyes and lenses, the two M-1a's run abreast of the I-1's; a true motive power parade!

The thunder of the two I-1's and the two M-1a's, abreast, all four engines wide open, will linger with us in memory for a long time to come. Would that we could record the sound of this action! The towering bulk of the mountains overhead acts as a giant sounding board, repeating the deafening echoes again and again.

Only Horseshoe Curve can furnish such drama!

Scarcely five minutes later passenger train No. 24, powered by two K-4's, 3733 and 1339, slips down the west slope into our awaiting cameras. Once again the white feathers bespeak of well trained firemen.

By 3:30 p.m. we have bagged 14 more train movements, including two mine-bound drags of empty gondolas, requiring no helpers. Following the advice of our guide, we

Courtesy Mutual Magazine, Pennsylvania RR.

Old Logan House in Altoona.

Built in 1853 when the Pennsylvania RR. was new, the old Logan House in Altoona, adjacent to the station, was operated as a hotel by the railroad company until July 1, 1927. It was then used as Middle Division offices until 1931, when sold to the government to be used as a postoffice site.

Climbing up, up, up.

Westbound trains are a symphony of smoke and steam and sound as they climb the 1.8 per cent grade at Horseshoe Curve. The single engine can handle a drag of empty coal cars, but it takes all the push and pull of the other four (center and bottom) to lift 110 loads over the backbone of the mountain.

Railroad Photographs, by H. W. Pontin.

decide to survey the situation at Gallitzin and Cresson for the next day's activities. Regretfully we take leave of our amphitheater, doubting if the other side of the mountain can offer us as much.

The three tunnels at Gallitzin break the continuity of main line, and are the gateway to the different gradients of the west slope, only 1 instead of 1.8 per cent.

A check on our records en route informs us that the Pennsy has placed a great deal of confidence in its Decapods, the I-1's; the Mountain type, M-1a; and its splendid Pacifics, the K-4's. Hauling freight over such torturous grades seems mighty easy for the prevailing Decapods, and we note that most of the drags boast of manifests covering 85 to 115 cars, with an exceptional train hitting the 125-car mark.

Four main lines, all laid in the heaviest of steel, none of them idle for long, break the back of the Alleghenies, and stand as a tribute to those men who could foresee the future—the day when Horseshoe Curve was to be an important link in the defense program of the nation.

Sacramento Northern RR.

★ Longest all-electric main line serves produce centers with network of tracks.

*A Compendium.**

IT may be a long time before an interurban electric railroad will beat the record length of main line of the Sacramento Northern. From the streetside terminal at 40th and Shafter in Oakland, California, to Chico is 176 miles, a stretch broken only by the half mile of the Sacramento River which the line crosses by ferry at Mallard. SN has many branches, too, giving the system a total route mileage of more than 260 miles.

The railroad was built, first, as several disconnected lines which joined together to build connecting links and to unify the system. Until 1929, however, the lines south of Sacramento were owned by a separate company.

Sacramento Valley is a rich plain of grass land which has been irrigated for many crops. It is surrounded by hills and mountains of considerable mineral value. The Sacramento River drains the valley through a narrow pass into San Francisco Bay, the world's second best land-locked harbor.

Around the bay are San Francisco, Oakland, Berkeley, Alameda, San Jose, Richmond and Vallejo, all important cities. The SN connects this bay area with Sacramento, the state capital, and with the valley (see map).

Since last Fall, traffic on the SN has been entirely freight except for service between San Francisco and Pittsburg. In days of interurban prosperity SN ran passenger trains all over the system. Most famous of these were the *Comet* and the *Meteor,* which operated with as many as six cars. Both trains operated the full distance from Chico to 'Frisco, the *Comet* going north in the morning, passing the *Meteor* at Sacramento. In the afternoon the procedure was reversed, with the trains passing near the southern terminal. There was also a local running the main and a number of trains that did not pass Sacramento.

No. 7, the *Comet,* was the hot shot. At one time it left Chico at 12:15 p.m., passed No. 2 (*Comet* northbound) at East Gridley, north of Live Oak, and worked its way to 40th and Shafter by 5:33 p.m. at an average speed, including stops, of 32 miles per hour for the 5¾-hour trip. These figures are based on the November 19, 1939, schedule.

North of Sacramento passenger traffic dropped off in the thirties due primarily to the competition of the excellent taxpaid highways. Excursion traffic, which used to be a welcome extra on all small railroads, also declined at a still earlier date, although the SN ran low fare Sunday trains that kept the effect minimized. With the drop in revenue, and with the expense of running trains from West Pittsburg, over the ferry, and across almost 50 miles of practically uninhabited river flats between the ferry and Sacramento, it was decided late in 1940 to discontinue all passenger service except between Pittsburg and Oakland. The final change went into effect November 1, 1940, leaving only a five-train service out of San Francisco.

SN freight business is important; the line serves a number of points not on other railroads, and runs through the heart of the valley. For this reason no track was torn up after the discontinuance of passenger service. Steeple cab locomotives and freight motors handle freight, largely on a way-freight basis.

STARTING in San Francisco at the bridge terminal which was built principally to accommodate Key System and Interurban Electric trains that pass over the San Francisco-Oakland Bay bridge, SN passenger cars use the bridge-owned tracks to the Oakland

*The material in this article was prepared by TRAINS' staff with the expert assistance of B. H. Ward, Bob Hannah, and Arthur R. Alter, each of whom spent many hours gathering material and photographs. Credit is also due the publication *Western Railroader,* from which important excerpts have been taken.

A. R. Alter, 259 E. 6th St., Los Angeles, Calif.

Northbound *Comet* leaves tunnel No. 1.

With the train number displayed clearly in the left front window it is easy to identify Sacramento Northern trains. The *Comet* ran all the way, San Francisco to Chico, 185 miles. No. 2 has been omitted entirely from the new schedules. Car 1006 is similar to 1003 to 1004, wooden combinations built by W. L. Holman Car Company for the Oakland & Antioch in 1911 and 1912. No. 1004 was wrecked in 1939. Tunnel date is 1910.

end. These tracks are equipped with both trolley at 1200 volts D. C. for IE and third rail for the Key at 600 volts D. C. SN uses the 1200-volt line with pantographs but changes to 600 volts D. C. at the east end, where Key changes from third rail to pantograph operation. SN uses Key tracks through Oakland, about two miles to its own terminal at 40th and Shaftner. Here cars change to pole trolley, 600 volts D. C. If you think the line has to change means of collecting current considerably in getting this far you haven't heard the half of it. At College Avenue pole trolley is still used, but voltage is increased to 1500 volts D. C. Voltage returns to 600 at Westgate, just before Sacramento. Beyond Sacramento third rail is used as standard on the main and all branches, but every important city means a change to pole trolley and back again. These lines are all 600 volts D. C. The only third rail in use south of Sacramento is on the branch between Vacaville and Willota.

Getting back to Shafter Avenue, the SN terminal is a wye, the south side of which is the Key System 40th Street tracks. One leg of the wye is straddled by a passenger station and some offices; the car barns and freight sidings are located off the other leg. SN trains operate over city streets on single track to beyond College Avenue, but from there on are almost entirely on private right of way, a very fortunate situation.

BEFORE the opening of the San Francisco-Oakland Bay bridge the Key Route ferry terminal was used. This was a long wharf extending over a mile into the bay with ferry slips at the end. Key ferries connected passengers with the famous Ferry Building at the foot of Market Street in San Francisco.

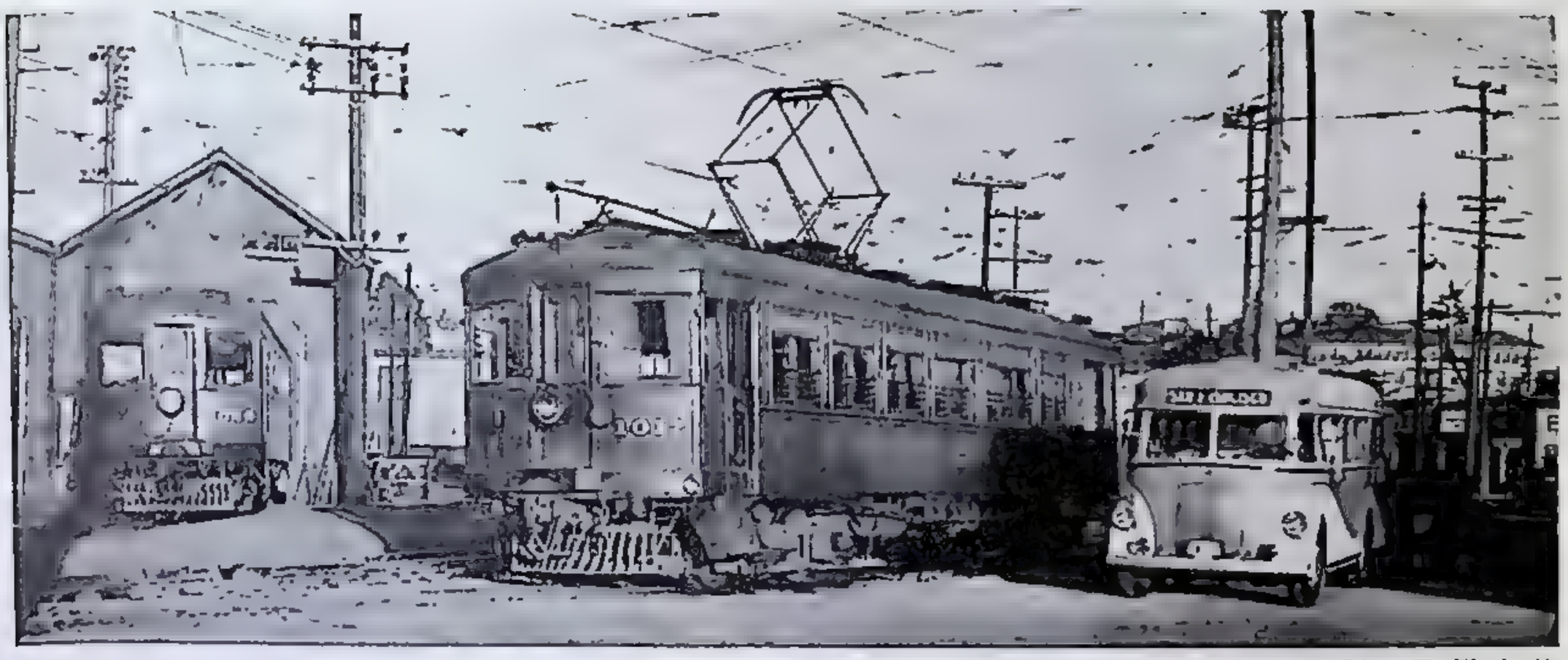
North of Oakland the railroad turns east into Temescal Canyon, climbs relocated tracks around a dam and follows a lazy narrow valley filled with scrubby California oak trees to the portal of Tunnel No. 1. This is also called Redwood Canyon Tunnel, and is among the longest trolley tunnels in the country, nearly a mile.

Redwood Canyon, east of the tunnel, is one of the most scenic sections of the route. In its bottom are groves of tall redwoods, and above the timber are steep slopes of grass which turns yellow in June. There is much wandering in the hills until the tracks descend into San Ramon Valley at Walnut Creek. This area of orchards is followed northward to the east lobe of San Francisco Bay, called Suisun Bay. Around the hills to the east is Pittsburg and the Mallard ferry landing where the lines cross the bay.

Trains roll through Temescal and Shepard canyons.

Three locomotives, a caboose, three box cars, a reefer and a tank car comprise this freight train. It is Extra 661 West with helpers 603 and 604 on the rear end (nearest camera) waiting for a meet with passenger trains 12 and 17 at Havens in Temescal Canyon. Below is the *Comet* pulling up a 3 per cent grade in Shepard Canyon farther to the east. The makeup of the train includes coaches, parlor and observation cars.

A. R. Alter.



Linn H. Westcott.

Waiting in yard at 40th and Shafter, Oakland.

Here are two SN coaches in front of the shops on the east leg of the terminal wye. South leg of wye is the 40th Street line of the Key System, a suburban railroad operating a number of local routes from San Francisco to Oakland and Berkeley. A Key Route signal can be seen in the right distance of the photo.

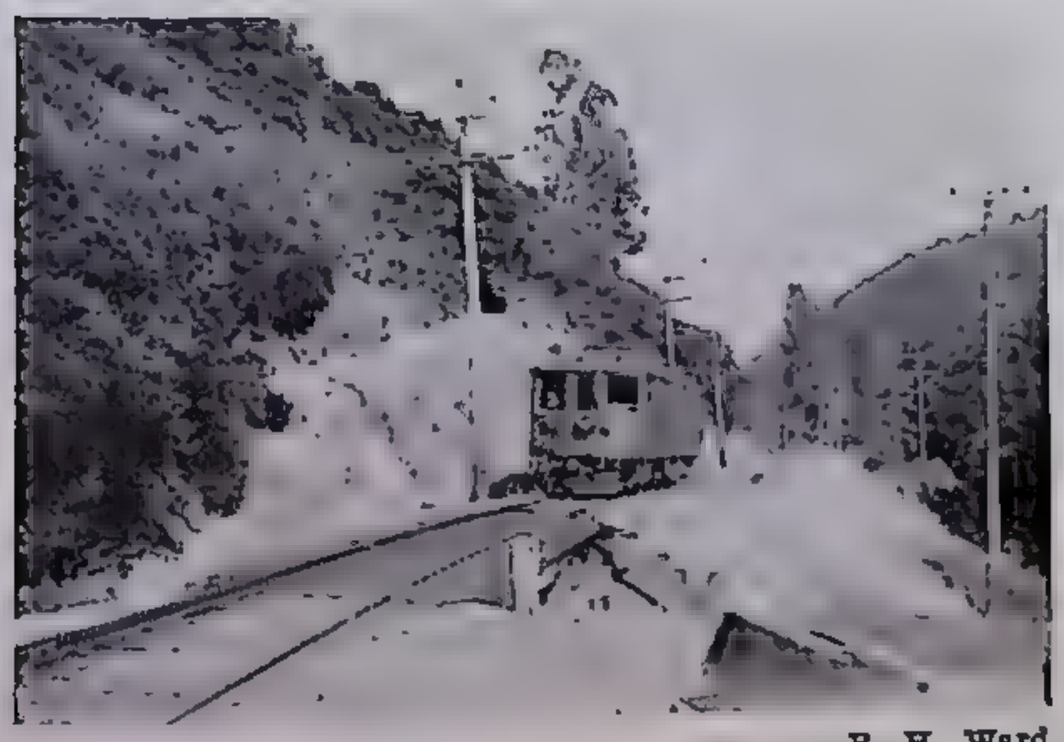
North of Pittsburg there is no more passenger service but, just as freight trains are now handled, whole trains were run onto the boat *Ramon* for the crossing. This ferry has three tracks; the center one is not used when there is enough load to fill the other two.

All the remaining part of the railroad is in relatively level country, the elevation of Chico being only 189 feet.

B. H. Ward, 745 Balboa, San Francisco, Calif.

Trains at speed.

Above is train No. 7 southbound from Marysville on Western Pacific tracks. Below, train No. 27 approaches the east portal of tunnel shown on page 37.



B. H. Ward.

It is still too early to say what will happen to the fleet of passenger cars of the SN. You can find a complete roster of SN equipment in the September-October, 1940, issue of the *Western Railroader* (Francis Guido, editor, 502 N. Claremont Street, San Mateo, California. Single copy 5 cents).

Numbers of passenger cars run from 21 to 1210 with the newer cars usually in the higher numbers. There are or were four named observation cars: *Alabama*, once private car for C. P. Huntington, built in 1902 for the Pacific Electric, burned in 1923; *Moraga*, which originally had platforms at both ends; and *Bidwell* and *Sacramento*. *Alabama* and *Sacramento* had dining facilities.

Other cars came from the Ocean Shore, a never-finished line from 'Frisco along the coast to Santa Cruz; the Philadelphia & Western; the San Jose Railroads; San Diego Electric Railway; and the United Railways of San Francisco. Car 1051, a wooden combination, was an old steam coach built in the eighties for the Central Pacific, later sold for use on the San Ramon branch, for which it was motorized. Trailers 1201 to 1207, used

Arthur R. Alter.

Ramon is the only interurban-carrying ferry.

This three-track boat has floated many a train of passengers and freight across Suisun Bay, connecting the northern and southern sections of the Sacramento Northern. It was built to replace a barge that burned in the first year of service. There was no need for the passengers to leave their seats, since cars ran onto the ferry under their own power. Freight trains are all that have been using the boat since last Fall.

extensively on picnic trains, were also old CP cars. These were sold to the Diamond Match Company.

Sacramento Northern History.

THE Sacramento Northern Railway was not built from terminus to terminus in an almost over-night building splurge. Rather, it was the steady growth of not one but several systems, each of which faithfully served the communities through which it passed for many years prior to its being welded into the present Sacramento Northern System. This railroad dates back, not to the period in American railroading when the interurban railway spread across the nation like a veritable spider web, but clear back to the days of the horse car. Its history follows:

The railway in its present state found its origin in the Marysville & Yuba City Street Railway, consisting of 3.2 miles of road between Marysville and Yuba City, designed for horse-drawn vehicles. All of the properties of this company have either been abandoned or entirely rebuilt since its acquisition on July 12, 1906, by the Northern Electric Company. The purchase of the Marysville & Yuba City Street Railway, which was incorporated August 17, 1889, was a stock transfer, deed to the property finally passing to the Northern Electric on November 14, 1911.

The next important link was the Chico Electric Street Railway, which consisted of 5.14 miles of trackage in the city of Chico, incorporation and construction taking place in 1904. Just one year later the line was sold to the Northern Electric Railway, which incorporated that year. None of this trackage is now in service, the greater part of it having been abandoned and the remainder reconstructed.

The major step in the unification of these two separate lines came about with the incorporation of the Northern Electric Company in 1905. This company built a main line from Chico to Sacramento, 90.5 miles; the Oroville Branch, 5.5 miles; and acquired the properties of the Hamilton Branch, 12.1 miles, all from 1905 to 1907. This step forward was a most important one, marking as it did the bringing together of the farm and produce communities of the upper California region with the key distribution points in central California. In addition, the electric line provided fast, dependable passenger service for the residents of the cities through which it passed.

In 1907, the Shasta Southern Railway constructed about four miles of road between Hamilton and Monroeville with the idea of establishing a supplementary route farther into the state. This was purchased by the Northern Electric Company and about two miles of it was electrified and operated as a continuance of the Hamilton Branch, which had been built by the Northern at about the same time. The combined branch was operated until 1913, when it was abandoned and removed due to lack of traffic. The same reason accounted for the Shasta Southern's failure to continue building into the northern part of the state.

The Northern Electric Railway Company, not to be confused with the predecessor organizations, incorporated on September 19, 1907, to acquire property of the Northern Electric Company, the property of the Shasta Southern Railway in 1909, and the property of the Vallejo & Northern Railroad in 1912. The latter company constructed 1.8 miles of track in Sacramento during 1911 and 1912, having incorporated two years before for that purpose. The Northern Electric Railway constructed 14.9 miles of the isolated Vacaville-Willota Branch in Solano County during 1913 and 1914 as part of a proposed line to the bay region and constructed the Globe-Swanston Branch, 1.5 miles, during 1914, to serve the meat-packing plant at Swanston. All properties were sold on July 1, 1918, to the Sacramento Northern Railroad, which also purchased the Sacramento Terminal Company, owning 5.73 miles of track in the city of Sacramento, of which 2.67

Golden State Transportation Historical Society; courtesy R. Hannah, 1645 83rd Ave., Oakland, Calif.

Steam power hauls electrics during construction.

This 4-4-0, Northern Electric No. 3, is about to pull two electric coaches on the not-yet-electrified line north of Marysville. The photo was taken about 1906 at Fifth Street in Marysville. Northern Electric cars 220 and 129 are behind the steamer. Notice the trolley poles on 129. The car on city track is No. 202. The trestle in the distance is on Western Pacific main line. Imagine a 1941 automobile rolling into this scene!

Sacramento terminal.

Cars swing into this paved platform from the city streets at the Union Station in Sacramento. Trains shown at right are Extra 1003, 7, 50, and 6.

Arthur R. Alter.

This horse car was the beginning of the Sacramento Northern.

Step right in, folks! All the way to Yuba City for a jitney; speeds you there at six miles an hour! Marysville and Yuba are twins on each side of Feather River. This line of the nineties connected the two cities.

Golden State Transportation Historical Society, courtesy R. Hannah.

miles was owned jointly with the Central California Traction company, dates of construction being 1909 and 1910.

On May 6, 1910, the Northern Electric Railway filed articles of incorporation for the Marysville & Colusa Branch of the system, which constructed a line from Colusa Junction to Colusa, 22.4 miles, in 1912 and 1913.

Meantime, on July 20, 1911, the Sacramento & Woodland Railroad incorporated to build a line between the two termini in its name, a line 16.8 miles in length, in 1911 and 1912. Behind the building of this portion of the system and of the Vallejo & Northern lies an interesting story. As originally projected, the Woodland line was to be extended past Woodland, through the Pleasant Valley country, and westward, where connection was to have been made with the San Francisco, Napa & Calistoga Railway, thus providing a shorter route to tidewater. But as the "plans o' mice and men aft gang agloo," this route never materialized, although surveys and grading extended from each line toward the other.

The depression which swept the world at the outset of the World War touched the Northern Electric Railway, as it did many other rail lines, with

Sacramento Northern has a great variety of rolling stock.

The rear end of the *Comet* differs in appearance from most trains in that the rounded-end observation car is equipped with a cow catcher. Shown below, in Temescal Canyon, is another train carrying the same observation car, *Moraga*. The photo was taken when *Moraga* had platforms on each end, and trolleys.

Upper A. R. Alter; lower Golden Gate Transportation Historical Society, courtesy R. Hannah.

the appointment of a receiver (John P. Coghlan) for the various lines which comprised the Northern Electric; but unlike many other railroads, the Northern wasn't content to sit back and bask in the idleness of receivership, which commenced in 1914. On June 20, 1918, the Sacramento Northern Railroad Company was incorporated, and took over the Northern Electric properties as of July 1, 1918.

Let us turn now to the bay region for a moment. At the time that the Northern Electric's progress had reached the building of the Vallejo & Northern line, 1909, a company known as the Oakland & Antioch Railway was organized and incorporated with the intention of connecting these points. In February, 1909, construction began on this electric interurban, which commenced at Bay Point. The line was put into operation between that point and Walnut Creek in May, 1911.

Finding that the capital of the original company was insufficient for a proposed extension to Sacramento, the owners incorporated the Oakland, Antioch & Eastern on April 1, 1911. The true intent of the new company was not disclosed, however, and the information was given out that the company was headed for Stockton. As soon as the new company was sufficiently backed, the intent was disclosed, and the company started construction of an electric line from Bay Point to Sacramento with a branch to Pittsburg.

In January, 1913, the Oakland, Antioch & Eastern leased the Oakland & Antioch Railway, and when the Oakland & Antioch finished the construction to Oakland, the OA&E's branch to Pittsburg opened on August 8, 1913.

In the meantime another line known as the San Ramon Valley Railroad was incorporated to build a line between Walnut Creek and Danville, Contra Costa County. The line was opened in March, 1914, and was leased almost immediately to the OA&E, which continued to operate it.

Meanwhile the Sacramento River was crossed by means of a ferry near West Pittsburg, where the OA&E used a wooden car ferry, the *Bridgit*. This boat had been in service only a year when it was destroyed by fire and was replaced by the 600-horsepower steel car ferry *Ramon*.

Seven miles of track including the Shafter Avenue line in Oakland had been built into Temescal Canyon by the Oakland & Bay Shore Railway Company in 1911. This track was taken over during construction by the Oakland & Antioch. It was at this time that a flat car broke loose, gained speed as it coasted down the canyon, and crashed through a street car at College Ave. Ever since, a locomotive has been placed at the rear of all freight trains out of Oakland.

Finally, in September, 1913, the Oakland, Antioch & Eastern was completed to Sacramento. With connections at Oakland with the San Francisco, Oakland & San Jose Railroad (Key System), a through line from San Francisco to Sacramento via Walnut Creek, Saranap, Bay Point, and West Pittsburg was to be operated.

The OA&E started an extension of the Pittsburg branch to Antioch, and had the right of way and steel, but in 1916, when some farmers of the Sacramento Valley started an electric line known as the Sacramento Valley Electric Railroad to run up the west side of the valley, the OA&E sold the steel to the new company. They started a line from Rio Junction, on the OA&E, to Dixon, but it was finished as far as Davis only. The steel for the Antioch line having been disposed of, its right of way reverted to the original owners.

Cooperating with the Sacramento Valley Railroad, the OA&E operated the line from Rio Junction to Davis for two years, but as the plan to build up the valley fell through and the existing line was unprofitable, the 11.17-mile line was abandoned.

With the decline of business on the San Ramon Valley branch the 11.7 miles of line between Sara-

B. H. Ward.

Combination coach.

Although very few cars are alike on the Sacramento Northern, this one might be called typical. Notice Railway Express Agency herald at rear.

Once a 2-4-4-2.

This engine, built in 1913, was the twin of No. 606 until it was rebuilt without pony trucks in 1928. The railroad has a number of steeple cab locomotives similar in appearance to this one. Some occasionally pulled passenger trains.

Linn H. Westcott.

nap and Danville was discontinued on March 1, 1924, and car No. 1051, which had been used on the line, was taken to the Oakland shops and scrapped.

The Oakland, Antioch & Eastern Railway was reorganized as the San Francisco-Sacramento Railroad Company in 1920. This company was in turn acquired by the Sacramento Northern Railway on December 31, 1928. This same corporation had taken over the properties of the Sacramento Northern Railroad on November 4, 1925.

Control of the company was acquired in August, 1927, by the Western Pacific Railroad, through the ownership by the Sacramento Company, a WP subsidiary, of 98.5 per cent of the capital stock of the San Francisco-Sacramento Railroad. The Sacramento Northern Railway had previously passed into control of the Western Pacific.

Since taking over various lines, the Sacramento Northern has constructed the Holland Branch between Riverview and Oxford, 15 miles, which was completed on June 29, 1939; extended the Pittsburg Branch .88 mile to reach the Columbia Steel Mills, completed April 1, 1930; and connected the Vacaville-Willota Branch, which formerly operated as a separate rail line, to the main line by building about nine miles of track between Vacaville Junction and Creed, completing this portion July 15, 1930.

Application was made to construct a branch 38 miles long to run from Willota Junction on the Vacaville-Willota branch to Petaluma but the line was never built. An additional six miles was added to this already famous line on January 15, 1939, when the interurban trains of the Sacramento Northern started service over the San Francisco-Oakland Bay Bridge, and the passengers of this line were delivered right in the center of San Francisco's business district.

On Vacaville Branch.

Sacramento Northern No. 106 was originally operated by the Northern Electric for passenger service on the isolated third-rail Vacaville-Willota branch. When passenger revenue proved itself to be a ghost in 1920, the car was given freight duty. This picture was taken at retirement in 1931, when the branch was connected to the main line by an extension from Creed. The trolley wire of the new line can be just discerned in the upper right corner. No. 106 never saw service on the main line.

Ralph Demoro, courtesy R. Hannah.

Pioneers rushed to Sacramento Valley for gold and for land.

Imagine yourself floating 300 miles above the surface of the earth, looking down upon a rectangle of California dirt 112 miles wide, 172 miles from north to south. This is the land represented by the map on page 44, a territory twice the size of Maryland. It was settled first by the mission fathers near San Jose *(Ho-zay)* and San Francisco, later by Spaniards, Mexicans and stray Yankees. In 1848 the United States pulled a few tricky maneuvers and a couple of accidents and ended up with California as a part of the Union. Barely a year later a man named Sutter discovered gold on his property east of Folsom. (Sutter didn't really discover the gold, an employee did, but you know how history is told.) People rushed to California by the thousands, San Francisco harbor was clogged with abandoned ships; eggs were a dollar each.

In the midst of this rush a railroad was built between Sacramento and Folsom. Later others were started, and since the completion of the transcontinental railroad in 1869, tracks have been extended all over the state. Most of them are Southern Pacific's; it was said at one time that the capitol of the state was not in Sacramento but the SP offices in 'Frisco.

Electric railroads began to appear in the very early part of this century. Shown in heavy white is the line of the Sacramento Northern with its many branches. The narrow white lines are other electric railroads; if dotted, operation has been discontinued. White arrows indicate projected routes of the SN or its ancestors which were never completed. Black lines show steam lines in the same manner, with the wide lines indicating main lines. Western Pacific (WP) owns stock of the SN and the Tidewater Southern (TS), once electric.

The great Sacramento Valley is a rich irrigated agricultural district broken here and there by cities and towns but with little rural population. East are the foothills of the high Sierras over which the Western Pacific and Southern Pacific main lines climb. To the south is the dryer San Joaquin *(Wah-keen)* Valley. Through it pass the lines of the Santa Fe and the SP's original route to Los Angeles. The valleys are separated from the Pacific by a range of parallel ridges forming the Coast Range, a fence that must be climbed or twisted through by all the routes to San Francisco Bay. Around the latter is the densest population center in all the West. The bay is crossed by a number of bridges, one of which carries passenger trains of the SN into San Francisco over the Key System. The bay area is a truck-farming and manufacturing district. In nearby valleys are orchards and to the north are the famous Sonoma and Napa wine producing localities.

Empire of the
Sacramento Northern Ry.
and its relatives ~
Coast
Range
Sacramento Valley
Sierra Nevada Range
American R.
Feather R.
Pacific Ocean
San Francisco Bay
San Joaquin R.
Hamilton
Chico
Oroville
Colusa
Marysville
Yuba City
Auburn
Folsom
Sacramento
Woodland
Davis
Calistoga
Yacaville
Napa
Willota
Fairfield (Suisun)
Vallejo
Oxford
Lodi
Stockton
Tracy
Modesto
Antioch
Pittsburg
Concord
Walnut Creek
Oakland
Niles
San Jose
Tunnel No. 1
Morgan Territory
Mt. Diablo
Empire
Durham
Orland
Willows
Dixon
Fairview
Elmira
Benicia
Martinez
Danville
Livermore
Mountain House
Manteca
Ripon
Oakdale
Riverbank
Modesto
Turlock
Merced
Madera
Fresno
Hanford
Visalia
Tulare
Bakersfield
Delano
Mojave
Tehachapi
Los Angeles
Santa Barbara
Ventura
Oxnard
Santa Paula
Fillmore
Saticoy
Piru
Santa Clara
Gilroy
Hollister
Salinas
Watsonville
Santa Cruz
Monterey
Pacific Grove
Carmel
Soledad
King City
Paso Robles
Templeton
Atascadero
San Luis Obispo
Guadalupe
Santa Maria
Lompoc
Surf
Gaviota
Goleta
Santa Barbara
Carpinteria
Ventura
Oxnard
Port Hueneme

Letters

★ Readers give views on this, that, and the other thing.

He Likes Trains, Too.

I AM an ex-ticket agent and an active railroad enthusiast. Due to my former connection, I would like to see an "open forum" for the benefit of the boys engaging in the sale of tickets to passengers. For instance, I noticed in one of your past issues your mention of the dishonest passenger substituting a $5 for a $10 bill in buying a ticket. This trick works frequently, to the embarrassment of the poor ticket man when he checks up the daily sales.

Then there's the passenger who steps to the window just as three or four trains are due, some local and some limited, and asks, "When does the train leave?" and becomes highly insulted because the ticket man, in an honest effort to be helpful, inquires, "Where to?" This type of passenger usually tells the agent, "It's none of your business where I'm going."

One of the strangest I've ever heard was of the lady who purchased a ticket near the eastern border of West Virginia to Tulsa, Okla. She then used the phone to send a telegram to her relative in Tulsa: "Leaving on the 10 o'clock train. Meet me." Imagine the confusion at the other end of the line, so easily avoided had the lady found out from the agent what time of what day she would arrive, and had she telegraphed *that* information instead of her leaving time!

Mr. Kalmbach's story in the January issue ["I *Like* Trains"] was swell, but I have one argument with him. If one is rushed to get to his destination, it is well to use an upper berth and so avoid a distracting window; but if the traveling is done for pleasure, a moonlight night, either Winter or Summer, never looks any finer to me than from a Pullman bed. The most luxurious feeling I ever had was on a cold Winter night. Lying in my berth, peeping through the window, I could see the passengers who had reached their destinations and had to leave the heated train to hurry to a taxi, or stand shivering over their baggage, awaiting relatives and friends, while I lay warm and comfortable in my bed, knowing I could stay there until well after daylight on the morrow. No upper berth can give you that thrill!

Box 188, Portsmouth, O. *A. M. Mitchell.*

Another Train Fan.

MANY thanks for your article on "I *Like* Trains." I have enjoyed almost the same instances of which Mr. Kalmbach wrote. One day on the C&NW's *Mountain Bluebird* I talked with a young lady on the way to California on her vacation. Two years later, on the UP's *Columbine*, I barged into the diner for breakfast, and there was the same girl, on her way to California again.

You ride the trains; I like to help them on their way. Now, when No. 22 is coming, I flip on the platform lights and take a place where I can watch those flying wheels. No. 22 whistles for town, and a moment later whistles for the crossing near the depot. The rails set up their talking, the building shakes slightly; with a final roar the engine is by, and clicking after it the cars are hurrying, jerking up some gravel to throw at the building. I swing my lantern in a highball to the flagman that all is rolling well. I pause before going inside the warm office and look after the train. I wonder if anyone I know is aboard. I hope he is having as nice a trip as I do when it is my turn to ride.

I like to get out in all kinds of weather to check the fill for the *Advance Omaha* or for the *RO Special* [freight trains]. . . . Later, after the *AO* is gone, I help the station baggage man with heavy cream and mail movements. Three passenger trains to work at once. . . . With help, the head end work is done before the blue flag is down. No delay on us tonight! . . . And so it goes.

Grainfield, Kas. *C. E. Smith.*

2¼ Million Miles.

I'VE just read TRAINS. Very interesting. I put in 51 years on an engine—2,246,000 miles, 168,000 tons of coal. I'm now pensioned. Good luck to you.

J. T. Heatcoole.

1547 Monroe St., Denver, Colo.

Railroads in the Streets.

A CONDITION that is all too prevalent even in this day and age is that of running trains right in the streets. Two years ago the New York Central stopped this practice in Syracuse, now using an elevated right of way, but the Lackawanna still uses the pavement, as

the photo shows. There is now some talk of elevating the Lackawanna, but I guess it'll be another 10 years before anything is done about it. However, my guess may be wrong.

Alex Stutter.

306 Slocum Ave., Syracuse, N. Y.

Cripple Creek Short Line.

THE brief account and pictures of the Colorado Springs & Cripple Creek District RR. [TRAINS, February] interested me very much, for I made the round trip from Colorado Springs to Cripple Creek and return one fine day in February, 1907. At that time both towns were flourishing, and I just missed an opportunity to go down into one of the big silver mines. It was stated that it cost an average of $85,000 a mile to build the railroad, and now it is but a memory to old-timers and Cripple Creek is practically a ghost town!

I got some striking pictures of the whole train, including the side of the coach in which I was riding, on the S curves. I took them from the bottom step of the rear platform while friendly hands held me by the shoulders. If I had fallen, I should have fallen not only to the roadbed, but the Lord only knows how much farther, before I hit bottom! Unfortunately, these pictures are long since gone; they would now be very valuable to publish in your pages.

R. Buettner.

5417 N. Sawyer Ave., Chicago, Ill.

Time on Our Hands.

GENERALLY speaking, TRAINS is excellent, but I do think a few more original photos would be in order. Also, some of the articles such as that on the GM&O [January] could stand a good deal of expansion. Even the news article concerning the merger printed in *Time* gave more detail than the TRAINS article.

I would like to mention two minor errors in the January issue. First, Jim Wilson gave you the wrong steer on the Laurel Line tunnel under Scranton ["Letters," page 38]. Second, the IC rail cars are not the first of their kind ["The Month," page 41]. The New York, Susquehanna & Western has had two similar cars in service since last July.

Alfred V. Neusser.

4021 61st St., Woodside, N. Y.

[TRAINS, after blushing, thanks Mr. Neusser and 137 other eagle-eyed readers. We bow to *Time*; will do better.—*Ed.*]

Thank You, Kind Sir!

I AM enclosing a picture of a sight that greeted me when I went to cover up a junior

member of Railroad Enthusiasts. You have my permission to print it if you wish.

Roland Cole.

303 Lathrop Rd., Syracuse, N. Y.

[A magazine can have no self-respect until it receives its first picture of itself in the hands of a very young gentleman or lady. Thanks to Mr. Cole, we are now self-respecting. But we'll ask the question before some critical reader has the chance: Did TRAINS put junior to sleep, or was it only the "sand man"?—*Ed.*]

"Locomotives on Parade"

★ New book tells story of American locomotives against backdrop of railroad history.

LOCOMOTIVES ON PARADE, by Edward Hungerford, Thomas Y. Crowell Co. $2.50. 230 pages.

EDWARD HUNGERFORD loves locomotives. And he is a railroad fan in the truest sense—one who, simply because he enjoyed it, has made himself familiar with every phase of the human and mechanical mechanism of rail transportation. True, he has for some years been associated with railroads and is now an officer of the New York Central, but he arrived at that stage by the unusual path of writing glowingly and understandingly about railroads, first as a newspaper reporter assigned to covering railroad news, and later in feature stores for national magazines and books. The B&O hired him to arrange its *Fair of the Iron Horse*, the first of the great railroad pageants, and he later did *Wings of a Century* at the Chicago Fair and *Railroads on Parade* at New York.

Locomotives on Parade is another hit volume by this author who knows his subject so well and writes of it so entertainingly. It is not strictly a history, certainly not a technical book. But it is a book which takes facts and puts them into their background, making of each locomotive that personality we all feel it to be, rather than just a machine with a serial number.

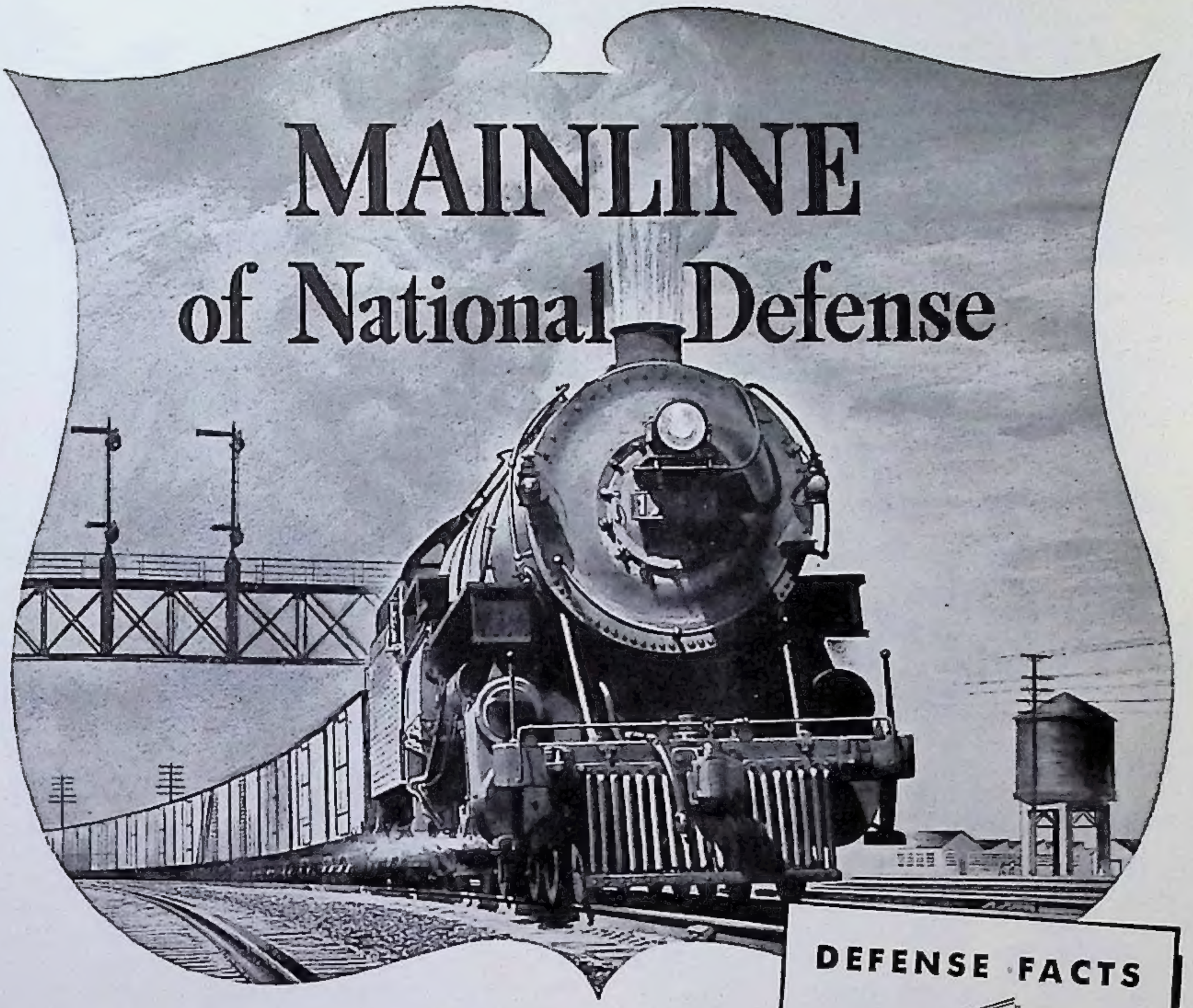
We are introduced to the New York Central Hudson type, for instance, not by figures of tractive effort and steam pressure, but by this bit of background:

> In the extravagant twenties, when railroading was tops and long distance passenger traffic as yet little disturbed by airway and the highway, it was a profound sight in the before-dawn of a January day to stand in Washington Street, Syracuse, in front of the imposing train shed of the old station there, and see 25 to 30 big passenger pullers preening themselves for as many great trains to haul east over the main line to Albany and to New York. The Sunday night after New Year's always marked high water in eastbound traffic on the Central. In the East, the schools were opening after the short Christmas holiday; the National Automobile Show (symbol of the oncoming rival of the Iron Horse) was being staged in Madison Square Garden, New York, and then it was that the tidal wave of eastbound traffic always rose to the crest. Millionaires and their wives from Cleveland, Toledo, Detroit, Chicago—their perky scions and the perky scions of still other millionaires—rode upon the luxury trains in droves. On just one of those nights the famed *Twentieth Century Limited*, out of Chicago for New York, had seven sections, each with 12 Pullmans. When the seven *Centuries* lined up side by side in the splendid vaulted train shed of La Salle Street Station it was a sight for the gods—and the stockholders of New York Central. Eight hundred and ninety-nine passengers—and not a deadhead in the lot. It would be a pretty wonderful transatlantic liner that would be carrying 899 first-class passengers. . . .

This is, in fact, not just a story of the locomotive, but the story of American railroading, with the locomotives as star actors moving across the stage against the props of expanding mileage, growing traffic, and a country being knit together by the iron rails. The scenes shift—now New England, now the South, now the Middle West. We read of the Mohawk & Hudson, the Baltimore & Ohio, the St. Paul & Pacific, and we see across the pages the shadows of Baldwin and Rogers and Norris and many other giants of early locomotive building. The scenes keep changing, leading us into the twentieth century and the evolution of the American railroad into the most efficient mass transportation machine the world has ever known. Against the background of the modern systems parade the creations of Lima and American and Baldwin; Westinghouse and General Electric are given their due, and the book closes with the Diesel shouldering its way into that elite family of machines.

The story of the steam locomotive has been told before, told in all its technical detail by experts, but never has it made such interesting reading. There's not only the text, but the illustrations. Photographs (and there are plenty) are perhaps not too well reproduced, but this is made up for by the excellence of the many line drawings of old-timers.

MAINLINE of National Defense



Like a mighty loom, weaving countless threads into a pattern of national security, the railroads of America shuttle the materials of defense from mine, forest and farm — to mill and factory — to assembly plant and warehouse — to camp and port.

There will be no time lost here. That is the American railroads' pledge to the American people - - a pledge based on preparedness which began twenty years ago. Railroad tracks and yards, cars and engines, shops and signals have been improved. Operating methods are more efficient, and organized cooperation among shippers, the government and the railroads makes it possible to get more use out of better railroad facilities.

Freight moves faster than ever before, it is switched and classified faster, and with the cooperation of shippers and the government it is unloaded faster. Cars are used for transportation, not storage.

Today America can look to its rail transportation system with full confidence. It is the finest mass transportation in the world. And it is ready to meet any demand of peacetime commerce or national defense.

NOW—TRAVEL ON CREDIT. America's railroads offer new, simple installment payment plan for trips and tours. **You can take your car along too. See your local ticket agent.**

DEFENSE FACTS

In July 1918, peak month of troop movements during the World War, the railroads moved an average of a little more than 20,000 men a day. In August 1940 the railroads moved troops to Army maneuvers at the rate of nearly 40,000 men a day.

For the new Army camps, the railroads handled a billion and a half board feet of lumber—60,000 carloads. Work was never held up because of any railroad failure to deliver materials—and there was not the least interruption of regular rail traffic.

Just two examples of what railroads mean to America's defense, in moving bodies of men and masses of materials over long distances, quickly, safely, on schedule.

ASSOCIATION OF AMERICAN RAILROADS WASHINGTON, D. C.

The Month

★ *Empire State Express* to be streamlined with Budd equipment.

★ The New York Central has ordered 32 stainless steel Budd-built cars to streamline its *Empire State Express*, 50-year-old New York-Buffalo (and lately Cleveland and Detroit) train. The schedule will be speeded up some. Streamlined Hudsons will pull the two trains. NYC has also ordered 95 new passenger coaches for general service.

★ The GM&O (January TRAINS, page 12) has issued something new in timetables, a folder with an attractive cover showing a romantic Southern scene and including an animated map of the territory, using small sketches to indicate the attractions of various points reached by the railroad.

★ Santa Fe on February 4 inaugurated the first Diesel in road freight service, an Electro-Motive four-unit 5400 h.p. locomotive similar to the one which has been tested by various roads. A second is also being built for Santa Fe. Regenerative braking is used. At the same time Santa Fe announced the remarkable record of its steam-pulled No. 39, 13½-hour fast freight between Chicago and Kansas City. In its first year of service No. 39 was 97 per cent on time.

★ New Haven and Pennsylvania have each ordered five new electric locomotives, the Pennsy's to be passenger jobs geared for 100 m.p.h., 10 m.p.h. faster than the GG-1's.

★ Railroad taxes for 1940 will reach an all-time high, estimated at 405 million dollars. The previous peak was in 1929, with 397 million dollars, but railroad gross revenue then was half again as high, and net earnings were twice as much.

★ Currently reconsidered is the proposition of a tunnel from Greenville, N. J., under New York Bay to Bay Ridge, Brooklyn, to carry freight and eliminate the barge transfer. Trains for New England would run through the tunnel and then over New York Connecting RR., the Hell Gate Bridge route.

★ This column will include condensed notices of all fan trips during the coming season. Send notice by the first of the month preceding date of issue or it cannot be included. This means the notice should be sent by the first of the month before that in which the trip is scheduled.

★ Fan trip: Detroit to Washington, B&O, leave Detroit 6:30 p.m. Friday, March 7, Toledo 8 p.m., Willard 10 p.m., Akron 11:30 p.m., Pittsburgh 1:45 a.m. Arrive Washington 9:30 a.m. Saturday. Returning, leave Washington 4:30 p.m. Sunday. Account National Model Railroad Association convention. Reservations with E. H. Beck, 921 Fox Theater Bldg., Detroit, by March 3.

★ Back cover photo: Extra 5100 east climbing Bozeman Mountain, ruling grade (1.9 per cent compensated) of the Northern Pacific between Seattle and St. Paul, eight miles east of Bozeman, Mont. Tonnage is 4017, just about the limit for this Class Z-6 4-6-6-4 simple articulated locomotive. The signal is No. 1324, a permissive block as indicated by the small yellow square below the signal arm. Trains can pass red permissive signals at restricted speed without stopping.

★ Norfolk & Western is building five streamlined 4-8-4 passenger locomotives in its Roanoke Shops and will improve 24 passenger cars.

Linn H. Westcott.

★ Chicago & North Western has ordered five Diesel units and 25 passenger cars with which to improve passenger service between Chicago and Wisconsin and southern Minnesota points. Chicago-Green Bay is the only service specifically talked of.

★ The North Shore Line has its new electric streamliners, christened *Electroliners*, and is using them five round trips a day between Chicago and Milwaukee. The photo at the left shows one in Milwaukee station for a pre-inaugural trip. Running time is somewhat faster and can be cut still further. With refurnished 700 series cars on other trains, the entire Chicago-Milwaukee service has been pepped up.

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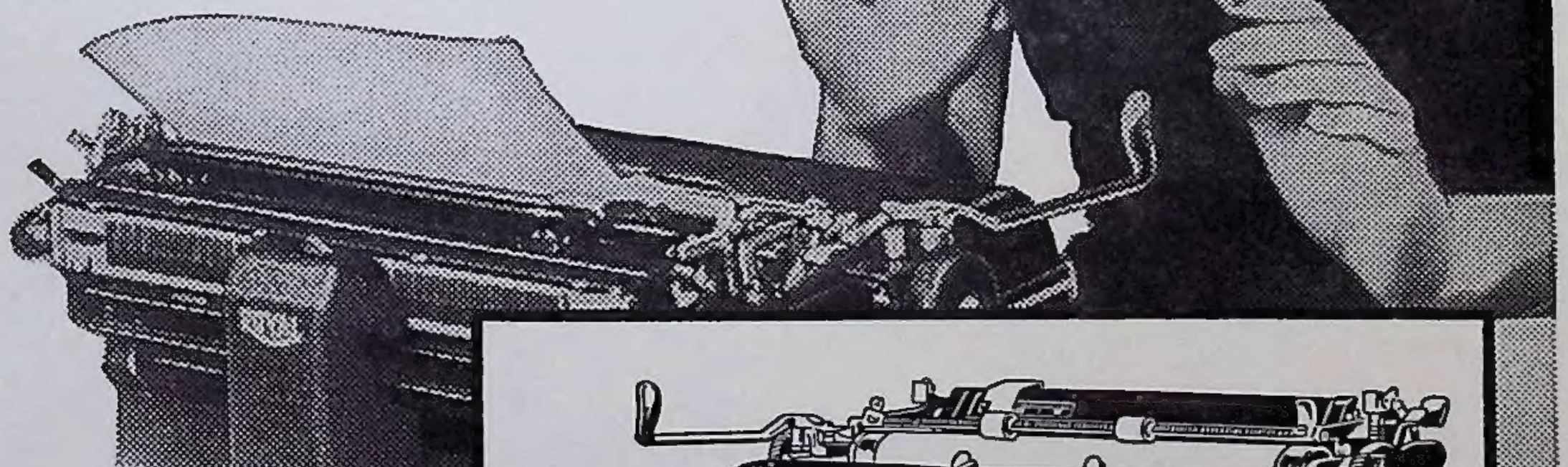

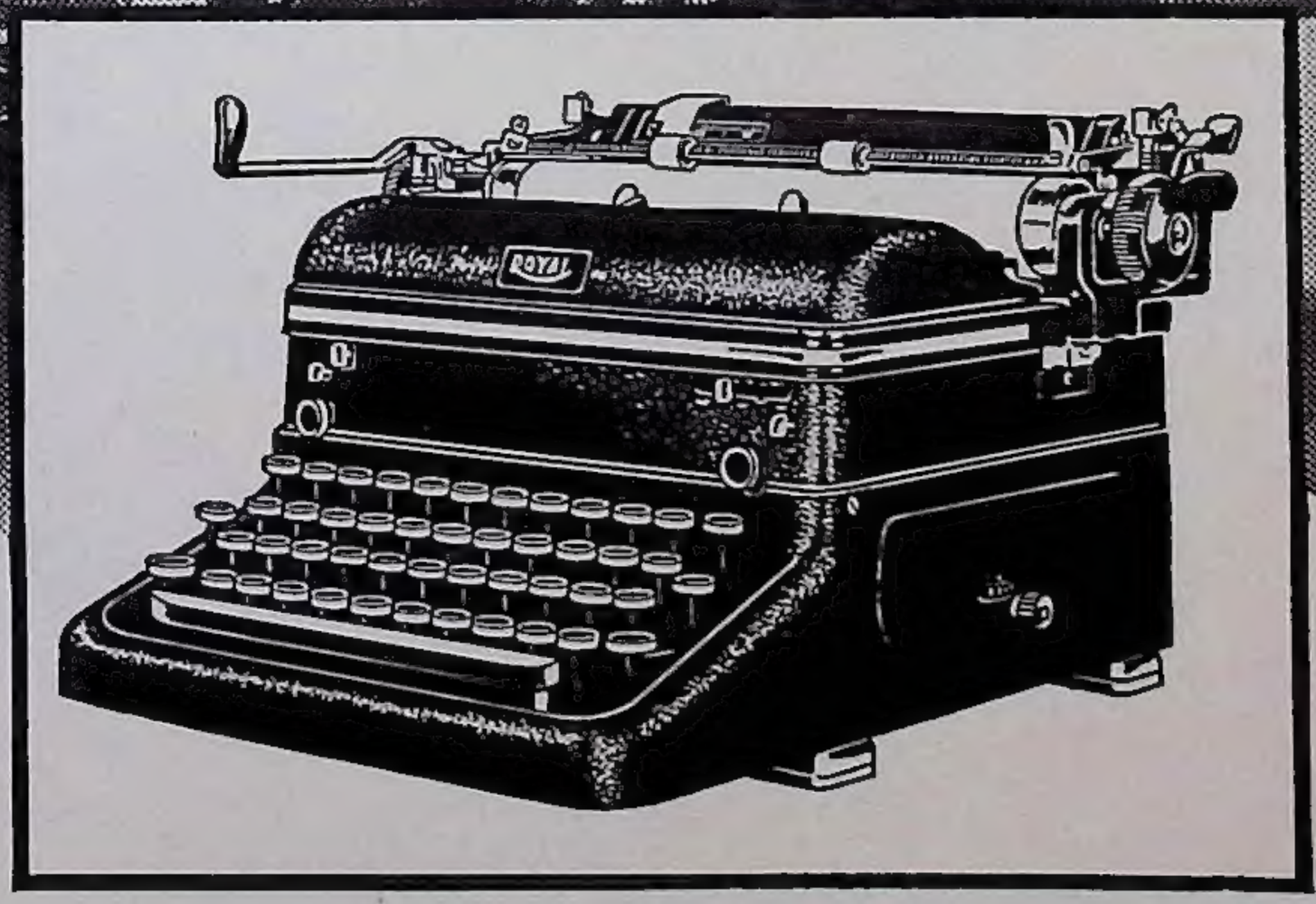

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